This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

Digitized by Google

BRANNER
GEOLOGICAL LIBRARY

STANFORD UNIVERSITY LIBRARIES

Digitized by Google

Digitized by Google

Digitized by Google

PLEASE DO NOT DESTROY OR THROW AWAY THIS PUBLICATION. If you have no further use for it, write to the Geological Survey at Washington and ask for a frank to return it

UNITED STATES DEPARTMENT OF THE INTERIOR

SURFACE WATER SUPPLY *of the* UNITED STATES 1929

PART VI

MISSOURI RIVER BASIN

Prepared in cooperation with the States of MONTANA, WYOMING, COLORADO, MISSOURI, and KANSAS

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 686

GEOLOGY DEPARTMENT
STANFORD UNIVERSITY

Digitized by Google

Digitized by Google

UNITED STATES DEPARTMENT OF THE INTERIOR
RAY LYMAN WILBUR, Secretary
GEOLOGICAL SURVEY
W. C. MENDENHALL, Director

Water-Supply Paper 686

SURFACE WATER SUPPLY *of the* UNITED STATES 1929

PART VI

MISSOURI RIVER BASIN

NATHAN C. GROVER, Chief Hydraulic Engineer
W. A. LAMB, ROBERT FOLLANSBEE, C. G. PAULSEN
J. B. SPIEGEL, and H. C. BECKMAN
District Engineers

Prepared in cooperation with the States of
MONTANA, WYOMING, COLORADO, MISSOURI,
and KANSAS

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1932

For sale by the Superintendent of Documents, Washington, D. C. - Price 50 cents, paper cover

Digitized by Google

Digitized by Google

CONTENTS

	Page
Authorization and scope of work	1
Definition of terms	2
Explanation of data	2
Accuracy of field data and computed results	4
Publications	5
Cooperation	10
Division of work	10
Gaging-station records	12
Missouri River proper	12
Red Rock River at Metzel Ford, near Monida, Mont	12
Red Rock River below Red Rock Reservoir, near Monida, Mont	13
Beaverhead River at Barratts, Mont	14
Jefferson River near Silverstar, Mont	15
Missouri River below Hauser Lake Dam, near Helena, Mont	16
Missouri River at Fort Benton, Mont	17
Missouri River near Williston, N. Dak	18
Missouri River at Sanish, N. Dak	19
Missouri River at Bismarck, N. Dak	20
Missouri River near Mobridge, S. Dak	21
Missouri River at Chamberlain, S. Dak	22
Missouri River at Sioux City, Iowa	23
Missouri River at Omaha, Nebr	24
Missouri River at Nebraska City, Nebr	25
Missouri River at St. Joseph, Mo	26
Missouri River at Leavenworth, Kans	27
Missouri River at Kansas City, Mo	28
Missouri River at Waverly, Mo	29
Missouri River at Boonville, Mo	30
Missouri River at Isbell, Mo	31
Missouri River at Hermann, Mo	32
Grasshopper Creek Basin	33
Grasshopper Creek near Dillon, Mont	33
Ruby River Basin	34
Ruby River near Alder, Mont	34
Big Hole River Basin	35
Big Hole River near Melrose, Mont	35
Boulder River Basin	36
Boulder River near Boulder, Mont	36
South Boulder Creek Basin	37
South Boulder Creek near Jefferson Island, Mont	37
Willow Creek Basin	38
Willow Creek near Willow Creek, Mont	38
Madison River Basin	39
Madison River near West Yellowstone, Mont	39
Madison River at Lyon, Mont	40
Madison River near Three Forks, Mont	41

Digitized by Google

Gaging-station records—Continued. Page
Gallatin River Basin 42
Gallatin River at Logan, Mont 42
Crow Creek Basin 43
Crow Creek near Radersburg, Mont 43
Prickly Pear Creek Basin 44
Prickly Pear Creek near Clancy, Mont 44
Tenmile Creek near Rimini, Mont 45
Tenmile Creek near Helena, Mont 46
Little Prickly Pear Creek Basin 47
Little Prickly Pear Creek near Marysville, Mont 47
Dearborn River Basin 48
Dearborn River near Clemons, Mont 48
Smith River Basin 49
Smith River near White Sulphur Springs, Mont 49
Smith River at Truly, Mont 50
Marias River Basin 51
Marias River near Shelby, Mont 51
Marias River near Brinkman, Mont 52
Birch Creek at Swift Dam, near Dupuyer, Mont 53
Birch Creek near Dupuyer, Mont 54
Dupuyer Creek near Valier, Mont 55
Dry Fork of Marias River at Fowler, Mont 56
Teton River near Fort Benton, Mont 57
Judith River Basin 58
Judith River near Utica, Mont 58
Judith River near Winifred, Mont 59
Musselshell River Basin 60
North Fork of Musselshell River at Delpine, Mont 60
Musselshell River at Harlowton, Mont 61
Musselshell River at Musselshell, Mont 62
Musselshell River at Mosby, Mont 63
Checkerboard Creek at Delpine, Mont 64
American Fork near Harlowton, Mont 65
Lebo Creek near Harlowton, Mont 66
Flatwillow Creek near Flatwillow, Mont 67
Flatwillow Creek at Petrolia, Mont 68
Milk River Basin 69
South Fork of Milk River near international boundary 69
Milk River at Milk River, Alberta 70
Milk River at eastern crossing of international boundary 71
Milk River above Havre, Mont 72
Milk River near Vandalia, Mont 73
North Fork of Milk River above St. Mary Canal, near Browning, Mont 74
North Fork of Milk River near international boundary 75
Big Sandy Creek near Boxelder, Mont 76
Lodge Creek at international boundary 77
McRea Coulee at international boundary 77
North Chinook Canal near Havre, Mont 78
Battle Creek at international boundary 79
Woodpile Coulee near international boundary 80
East Fork of Battle Creek near international boundary 81
Lyons Coulee at international boundary 82

Digitized by Google

Gaging-station records—Continued.
Milk River Basin—Continued. Page
Matheson Canal near Chinook, Mont 83
Whitewater Creek near international boundary 84
Frenchman River at international boundary 85
Frenchman Canal near Saco, Mont 86
Rock Creek at international boundary 87
Horse Creek at international boundary 88
McEachern Creek at international boundary 89
Yellowstone River Basin 90
Yellowstone Lake at Lake Hotel, Yellowstone National Park 90
Yellowstone River at Yellowstone Lake outlet, Yellowstone National Park 91
Yellowstone River near Canyon Hotel, Yellowstone National Park 93
Yellowstone River at Corwin Springs, Mont 94
Yellowstone River near Livingston, Mont 95
Yellowstone River at Billings, Mont 96
Yellowstone River at Miles City, Mont 97
Yellowstone River at Intake, Mont 98
Tower Creek at Tower Falls, Yellowstone National Park 99
Lamar River near Tower Falls ranger station, Yellowstone National Park 100
Gardiner River at Mammoth Hotel, Yellowstone National Park 101
Shields River at Clyde Park, Mont 102
Boulder River near Contact, Mont 103
Stillwater River near Nye, Mont 104
Clark Fork below Crandall Creek, Wyo 105
Clark Fork at Chance, Mont 106
Clark Fork at Edgar, Mont 107
Sunlight Creek near Painter, Wyo 108
Wind River at Riverton, Wyo 109
Big Horn River at Thermopolis, Wyo 110
Big Horn River at Kane, Wyo 111
Big Horn River near Hardin, Mont 112
Dinwoody Creek near Burris, Wyo 113
Dry Creek near Burris, Wyo 114
Willow Creek near Crowheart, Wyo 115
Bull Lake Creek near Lenore, Wyo 116
Little Wind River near Fort Washakie, Wyo 117
North Fork of Little Wind River at Fort Washakie, Wyo 118
South Fork of Owl Creek near Thermopolis, Wyo 119
Greybull River at Meeteetse, Wyo 120
Shoshone River below Shoshone Reservoir, Wyo 121
Shoshone River at Byron, Wyo 122
Little Horn River near Crow Agency, Mont 123
Tongue River near Dayton, Wyo 124
Tongue River near Decker, Mont 125
Tongue River near Miles City, Mont 126
Powder River at Arvada, Wyo 127
Powder River at Moorhead, Mont 128
Powder River near Mizpah, Mont 129
Middle Fork of Powder River at Kaycee, Wyo 130
Red Fork near Barnum, Wyo 131

Digitized by Google

Gaging-station records—Continued.
Yellowstone River Basin—Continued. Page
North Fork of Powder River near Kaycee, Wyo 132
Crazy Woman Creek near Buffalo, Wyo 133
Clear Creek near Arvada, Wyo 134
Little Missouri River Basin 135
Little Missouri River near Alzada, Mont 135
Little Missouri River at Medora, N. Dak 136
Knife River Basin 137
Knife River at Hazen, N. Dak 137
Heart River Basin 138
Heart River at Sunny, N. Dak 138
Cannonball River Basin 139
Cannonball River near Timmer, N. Dak 139
Grand River Basin 140
Grand River near Wakpala, S. Dak 140
Moreau River Basin 141
Moreau River at Promise, S. Dak 141
Cheyenne River Basin 142
Cheyenne River at Edgemont, S. Dak 142
Cheyenne River near Wasta, S. Dak 143
Cheyenne River near Carlin, S. Dak 144
Beaver Creek near Burdock, S. Dak 145
Rapid Creek near Pactola, S. Dak 145
Rapid Creek at Creston, S. Dak 147
Belle Fourche River near Moorcraft, Wyo 148
Belle Fourche River at Hulett, Wyo 149
Belle Fourche River near Belle Fourche, S. Dak 150
Belle Fourche River near Elm Springs, S. Dak 151
Redwater Creek near Beulah, Wyo 152
Bad River Basin 153
Bad River near Fort Pierre, S. Dak 153
White River Basin 154
White River near Interior, S. Dak 154
White River near Oacoma, S. Dak 155
South Fork of White River near White River, S. Dak 156
Niobrara River Basin 157
Niobrara River near Gordon, Nebr 157
Niobrara River near Valentine, Nebr 158
Niobrara River near Spencer, Nebr 159
James River Basin 160
James River at Jamestown, N. Dak 160
James River at Huron, S. Dak 161
James River near Scotland, S. Dak 162
Big Sioux River Basin 163
Big Sioux River near Flandreau, S. Dak 163
Big Sioux River at Akron, Iowa 164
Little Sioux River Basin 165
Little Sioux River at Correctionville, Iowa 165
Platte River Basin 166
Grizzly Creek near Walden, Colo 166
North Platte River near Walden, Colo 167
North Platte River near Northgate, Colo 168
North Platte River at Saratoga, Wyo 169

Digitized by Google

Gaging-station records—Continued.
Platte River Basin—Continued. Page
North Platte River above Pathfinder Reservoir, Wyo. 170
North Platte River below Pathfinder Reservoir, Wyo. 171
North Platte River at Casper, Wyo. 172
North Platte River at Douglas, Wyo. 173
North Platte River below Guernsey Reservoir, Wyo. 174
North Platte River below Whalen, Wyo. 175
North Platte River at Wyoming-Nebraska line. 176
Platte River near Duncan, Nebr. 177
Platte River near Ashland, Nebr. 178
Roaring Fork near Walden, Colo. 179
Michigan River at Walden, Colo. 180
Illinois Creek at Walden, Colo. 181
Canadian River at Cowdrey, Colo. 182
Encampment River at Encampment, Wyo. 183
Pass Creek near Saratoga, Wyo. 184
Rock Creek near Rock River, Wyo. 185
Deer Creek at Glenrock, Wyo. 186
Boxelder Creek near Careyhurst, Wyo. 187
La Prele Creek near Douglas, Wyo. 188
La Prele Creek near Orpha, Wyo. 189
Wagonhound Creek near La Bonte, Wyo. 190
La Bonte Creek near La Bonte, Wyo. 191
Horseshoe Creek near Glendo, Wyo. 192
Cottonwood Creek at Wendover, Wyo. 193
Laramie River near Glendevey, Colo. 194
Laramie River near Jelm, Wyo. 195
Laramie River at Fort Laramie, Wyo. 196
Rawhide Creek near Lingle, Wyo. 197
Katzer Drain near Henry, Nebr. 198
Horse Creek near Yoder, Wyo. 199
South Platte River at South Platte, Colo. 200
North Fork of South Platte River at South Platte, Colo. 201
West Fork of Clear Creek near Empire, Colo. 202
Clear Creek near Golden, Colo. 203
North St. Vrain Creek near Allens Park, Colo. 204
South St. Vrain Creek near Ward, Colo. 205
Middle St. Vrain Creek near Allens Park, Colo. 206
Lefthand Creek near Boulder, Colo. 207
North Boulder Creek near Nederland, Colo. 208
Thompson River below power house, near Drake, Colo. 209
Thompson River at mouth of canyon, near Drake, Colo. 210
Little Thompson River near Berthoud, Colo. 211
Cache la Poudre River above Chambers Lake outlet, Colo. 212
Cache la Poudre River near Log Cabin, Colo. 213
South Fork of Cache la Poudre River near Eggers, Colo. 214
North Fork of Cache la Poudre River at Livermore, Colo. 215
Middle Loup River at St. Paul, Nebr. 216
Loup River near Genoa, Nebr. 217
North Loup River near St. Paul, Nebr. 218
Elkhorn River at Waterloo, Nebr. 219
Tarkio River Basin. 220
Tarkio River at Fairfax, Mo. 220

Digitized by Google

Gaging-station records—Continued. Page
Nodaway River Basin 221
Nodaway River near Burlington Junction, Mo 221
Platte River Basin (Iowa-Missouri) 222
Platte River at Conception Junction, Mo 222
Platte River at Agency, Mo 223
Kansas River Basin 224
Republican River at Max, Nebr 224
Republican River near Bloomington, Nebr 225
Republican River at Scandia, Kans 226
Republican River at Wakefield, Kans 227
Kansas River at Ogden, Kans 228
Kansas River at Wamego, Kans 229
Kansas River at Topeka, Kans 230
Kansas River at Bonner Springs, Kans 231
Frenchman Creek near Hamlet, Nebr 232
Sappa Creek near Oberlin, Kans 233
Beaver Creek at Ludell, Kans 234
Prairie Dog Creek near Woodruff, Kans 235
Smoky Hill River at Jerome, Kans 236
Smoky Hill River at Pfeifer, Kans 237
Smoky Hill River at Ellsworth, Kans 238
Smoky Hill River near Mentor, Kans 239
Smoky Hill River at Solomon, Kans 240
Saline River near Wilson, Kans 241
Saline River at Tescott, Kans 242
South Fork of Solomon River at Alton, Kans 243
Solomon River at Beloit, Kans 244
Solomon River at Niles, Kans 245
North Fork of Solomon River at Kirwin, Kans 246
Big Blue River at Hull, Kans 247
Big Blue River at Randolph, Kans 248
Little Blue River near Endicott, Nebr 249
Little Blue River at Waterville, Kans 250
Soldier Creek at Topeka, Kans 251
Delaware River at Valley Falls, Kans 252
Wakarusa River near Lawrence, Kans 253
Stranger Creek near Tonganoxie, Kans 254
Grand River Basin 255
Grand River near Gallatin, Mo 255
Grand River near Sumner, Mo 256
Thompson River at Trenton, Mo 257
Medicine Creek near Galt, Mo 258
Locust Creek near Milan, Mo 259
Locust Creek near Linneus, Mo 260
Yellow Creek near Rothville, Mo 261
Chariton River Basin 262
Chariton River at Elmer, Mo 262
Chariton River near Keytesville, Mo 263
Lamine River Basin 264
Lamine River at Clifton City, Mo 264

Digitized by Google

Gaging-station records—Continued. Page
Osage (Marais des Cygnes) River Basin 265
Osage River near Quenemo, Kans 265
Osage River near Ottawa, Kans 266
Osage River at Trading Post, Kans 267
Osage River at Warsaw, Mo 268
Osage River near Bagnell, Mo 269
Little Osage River at Stotesbury, Mo 270
Marmaton River near Fort Scott, Kans 271
Sac River near Stockton, Mo 272
Little Sac River near Springfield, Mo 273
South Grand River near Brownington, Mo 274
Niangua River near Roach, Mo 275
Bennett Spring at Brice, Mo 276
Gascónade River Basin 277
Gasconade River near Hazlegreen, Mo 277
Gasconade River near Waynesville, Mo 278
Gasconade River at Jerome, Mo 279
Gasconade River near Rich Fountain, Mo 280
Piney Creek near Big Piney, Mo 281
Little Piney Creek at Newburg, Mo 282
Miscellaneous discharge measurements 283
Index 285

ILLUSTRATION

Page
FIGURE 1. Typical river-measurement station showing concrete well and house for water-stage recorder and staff gages, cable, and car... 4

Digitized by Google

Digitized by Google

SURFACE WATER SUPPLY OF MISSOURI RIVER BASIN, 1929

AUTHORIZATION AND SCOPE OF WORK

This volume is one of a series of 14 reports presenting results of measurements of flow made on streams in the United States during the year ending September 30, 1929.

The data presented in these reports were collected by the United States Geological Survey under the following authority contained in the organic law (20 Stat. L., p. 394):

Provided, That this officer [the Director] shall have the direction of the Geological Survey and the classification of public lands and examination of the geological structure, mineral resources, and products of the national domain.

The work was begun in 1888 in connection with special studies relating to irrigation. Since the fiscal year ending June 30, 1895, successive appropriation bills passed by Congress have carried the following items:

For gaging the streams and determining the water supply of the United States, and for the investigation of underground currents and artesian wells, and for the preparation of reports upon the best methods of utilizing the water resources.

Annual appropriations for the fiscal years ending June 30, 1895–1930

1895	$12,500.00	1919	$148,244.10
1896	24,500.00	1920	175,000.00
1897–1899	50,000.00	1921–1923	180,000.00
1900	70,000.00	1924–25	170,000.00
1901–2	100.000,00	1926	165,000.00
1903–1906	200,000.00	1927	151,000.00
1907	150,000.00	1928	147,000.00
1908–1910	100,000.00	1929	270,500.00
1911–1917	150,000.00	1930	275,000.00
1918	175,000.00		

In the execution of the work many private and State organizations have cooperated, either by furnishing data or by assisting in collecting data. Acknowledgments for cooperation of the first kind are made in connection with the description of each station affected; cooperation of the second kind is acknowledged on page 10.

Measurements of stream flow have been made at about 5,830 points in the United States and also at many points in Alaska and the Hawaiian Islands. In July, 1929, 2,240 gaging stations were being

Digitized by Google

maintained by the Geological Survey and the cooperating organizations. Many miscellaneous discharge measurements were made at other points. In connection with this work, data were also collected in regard to precipitation, evaporation, storage reservoirs, river profiles, and water power in many sections of the country and will be made available in water-supply papers from time to time.

DEFINITION OF TERMS

The volume of water flowing in a stream—the "run-off" or "discharge"—is expressed in various terms, each of which has become associated with a certain class of work. These terms may be divided into two groups—(1) those that represent a rate of flow, as second-feet, gallons per minute, miner's inches, and discharge in second-feet per square mile, and (2) those that represent the actual quantity of water, as run-off in inches, acre-feet, and millions of cubic feet. The principal terms used in this series of reports are second-feet, second-feet per square mile, run-off in inches, and acre-feet. They may be defined as follows:

"Second-feet" is an abbreviation for "cubic feet per second." A second-foot is the rate of discharge of water flowing in a channel of rectangular cross section 1 foot wide and 1 foot deep at an average velocity of 1 foot per second. It is generally used as a fundamental unit from which others are computed.

"Second-feet per square mile" is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the run-off is distributed uniformly both as regards time and area.

"Run-off in inches" is the depth to which an area would be covered if all the water flowing from it in a given period were uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in inches.

An "acre-foot," equivalent to 43,560 cubic feet, is the quantity required to cover an acre to the depth of 1 foot. The term is commonly used in connection with storage for irrigation.

The following terms not in common use are here defined.

"Stage-discharge relation," an abbreviation for the term "relation of gage height to discharge."

"Control," a term used to designate the natural section or stretch of the channel or artificial structure below the gage which determines the stage-discharge relation at the gage.

EXPLANATION OF DATA

The data presented in this report cover the year beginning October 1, 1928, and ending September 30, 1929. At the beginning of January in most parts of the United States much of the precipitation in

Digitized by Google

the preceding three months is stored in the form of snow or ice, or in ponds, lakes, and swamps, or as underground water, and this stored water passes off in the streams during the spring break-up. At the end of September, on the other hand, the only stored water available for run-off is possibly a small quantity in the ground; therefore the run-off for the year beginning October 1 is practically all derived from precipitation within that year.

The base data collected at gaging stations consist of records of stage, measurements of discharge, and general information used to supplement the gage heights and discharge measurements in determining the daily flow. The records of stage are obtained either from direct readings on a staff or chain gage or from a water-stage recorder that gives a continuous record of the fluctuations. Measurements of discharge are made with a current meter by the general methods outlined in standard textbooks on the measurement of river discharge. A typical gaging station, equipped with water-stage recorder and measuring cable and car, is shown in Figure 1.

From the discharge measurements rating tables are prepared that give the discharge for any stage. The application of the daily gage height to these rating tables gives the daily discharge from which the monthly and yearly mean discharge is computed.

The data presented for each gaging station in the area covered by this report comprise a description of the station, a table showing the daily discharge of the stream, and a table of monthly and yearly discharge and run-off.

The description of the station gives, in addition to statements regarding location and type of gage, information as to diversions that decrease the flow at the gage, artificial regulation, maximum and minimum recorded stages, and the accuracy of the records. The maximum discharge given under "Extremes" does not represent the crest discharge unless a water-stage recorder was in operation or unless a nonrecording gage was read at the time of the crest.

The table of daily discharge gives, in general, the discharge in second-feet corresponding to the daily gage height which may be a once-daily reading or the mean of twice-daily readings of a nonrecording gage, or the mean daily gage height obtained from a water-stage recorder graph.

At stations on streams subject to sudden or rapid diurnal fluctuation the discharge obtained from the rating table and the mean daily gage height may not be the true mean discharge for the day. If such stations are equipped with water-stage recorders the mean daily discharge may be obtained by averaging discharge at regular intervals during the day or by using the discharge integrator, an instrument for obtaining mean daily discharge from a continuous gage-height graph and containing as an essential element the rating curve of the station.

Digitized by Google

In the table of monthly discharge the column headed "Maximum" gives the maximum daily discharge, and not the discharge when the water surface was at crest height. Likewise, in the column headed "Minimum" the quantity given is the minimum daily discharge. The column headed "Mean" is the average flow in cubic feet per

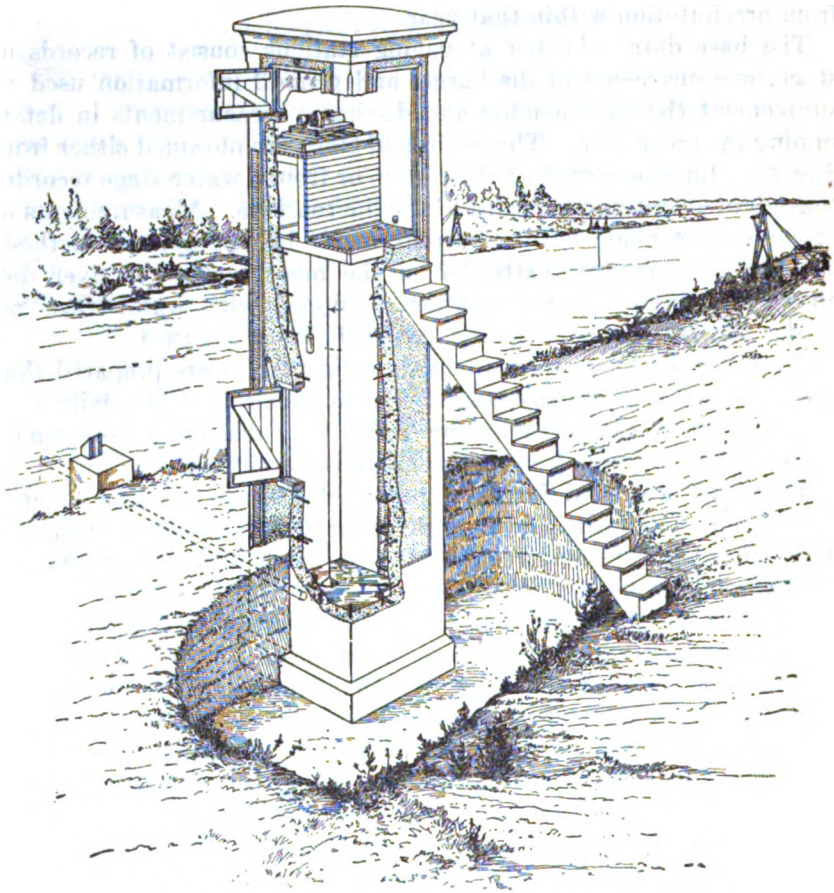

FIGURE 1.—Typical river-measurement station showing concrete well and house for water-stage recorder and staff gages, cable, and car

second during the month. On this average flow are based computations recorded in the remaining columns, which are defined on page 2.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS

The accuracy of stream-flow data depends primarily (1) on the permanency of the stage-discharge relation and (2) on the accuracy of observation of stage, measurements of flow, and interpretation of records.

Digitized by Google

The station description gives a statement in regard to the general accuracy of the records. "Excellent" indicates that records are accurate within 5 per cent; "good," within 10 per cent; "fair," within 15 per cent; and "poor," 20 per cent or more.

The monthly means for any station may represent with high accuracy the quantity of water flowing past the gage, but the figures showing discharge per square mile and run-off in inches may be subject to gross errors caused by the inclusion of large noncontributing districts in the measured drainage area, by lack of information concerning water diverted for irrigation or other use, or by inability to interpret the effect of artificial regulation of the flow of the river above the station. "Second-feet per square mile" and "run-off in inches" are therefore not computed if such errors appear probable. The computations are also omitted for stations on streams draining areas in which the annual rainfall is less than 20 inches.

The table of monthly discharge gives a general idea of the flow at the station. The table of daily discharge allows more detailed studies of the variation in flow. It should be borne in mind, however, that the observations in each succeeding year may be expected to throw new light on data previously published.

Many gaging stations on streams in the irrigated areas of the United States are situated above most of the diversions from those streams, and the discharge recorded does not show the water supply available for further development, as prior appropriations below the stations must first be satisfied.

PUBLICATIONS

Investigation of water resources by the United States Geological Survey has consisted in large part of measurements of the volume of flow of streams and studies of the conditions affecting that flow, but it has comprised also investigation of such closely allied subjects as irrigation, water storage, water powers, underground waters, and quality of waters. Most of the results of these investigations have been published in the series of water-supply papers, but some have appeared in the bulletins, professional papers, annual reports, and monographs.

The results of stream-flow measurements are now published annually in 12 parts, each part covering an area whose boundaries coincide with natural-drainage features as indicated below:

Part I. North Atlantic slope basins (St. John River to York River).
II. South Atlantic slope and eastern Gulf of Mexico basins (James River to the Mississippi).
III. Ohio River Basin.
IV. St. Lawrence River Basin.
V. Hudson Bay and upper Mississippi River Basins.
VI. Missouri River Basin.
VII. Lower Mississippi River Basin.

Digitized by Google

VIII. Western Gulf of Mexico basins.
IX. Colorado River Basin.
X. The Great Basin.
XI. Pacific slope basins in California.
XII. North Pacific slope drainage basins, in three parts:
A, Pacific slope basins in Washington and upper Columbia River Basin.
B, Snake River Basin.
C, Pacific slope basins in Oregon and lower Columbia River Basin.

Water-supply papers and other publications of the United States Geological Survey containing data in regard to the water resources of the United States may be obtained or consulted as indicated below.

1. Copies may be purchased at nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D. C., who will, on application, furnish lists giving prices.

2. Sets of the reports may be consulted in the libraries of the principal cities in the United States.

3. Sets are available for consultation in the local offices of the water-resources branch of the Geological Survey, as follows:

Augusta, Me., Statehouse.
Boston, Mass., 2500 Customhouse.
Hartford, Conn., 318 State Office Building.
Albany, N. Y., 506 Broadway-Arcade Building.
Trenton, N. J., 710 Trenton Trust Building.
Harrisburg, Pa., Closter Building.
Charlottesville, Va., Brooks Museum, University of Virginia.
South Charleston, W. Va., Naval Ordnance Plant.
Asheville, N. C., 220 Post Office Building.
Columbia, S. C., 801 National Loan & Exchange Bank Building.
Ocala, Fla., Post Office Building.
Tuscaloosa, Ala., Post Office Building.
Chattanooga, Tenn., 630 Power Building.
Columbus, Ohio, Engineering Experiment Station, Ohio State University.
Indianapolis, Ind., 319 Federal Building.
Chicago, Ill., 1503 Consumers Building.
Madison, Wis., 337N State Capitol.
St. Paul, Minn., 202 Old State Capitol.
Topeka, Kans., 23 Federal Building.
Rolla, Mo., Rolla Building, School of Mines and Metallurgy.
Fort Smith, Ark., Post Office Building.
Austin, Tex., State Capitol.
Santa Fe, N. Mex., State Capitol.
Tuscon, Ariz., 210 Post Office Building.
Denver, Colo., 403 Post Office Building.
Salt Lake City, Utah, 313 Federal Building.
Idaho Falls, Idaho, 228 Federal Building.
Boise, Idaho, Federal Building.
Helena, Mont., 416 Power Block.
Tacoma, Wash., 406 Federal Building.
Portland, Oreg., 606 Post Office Building.
San Francisco, Calif., 303 Customhouse.
Los Angeles, Calif., 751 South Figueroa Street, room 510.
Honolulu, Hawaii, Territorial Office Building.

Digitized by Google

A list of the Geological Survey's publications may be obtained by applying to the Director, United States Geological Survey, Washington, D. C.

Stream-flow records have been obtained at about 5,830 points in the United States, and the data obtained have been published in the reports tabulated below.

Stream-flow data in reports of the United States Geological Survey

[A = Annual Report; B = Bulletin; W = Water-Supply Paper]

Report	Character of data	Year
10th A, pt. 2	Descriptive information only	
11th A, pt. 2	Monthly discharge and descriptive information	1884 to Sept., 1890.
12th A, pt. 2	do	1884 to June 30, 1891.
13th A, pt. 3	Mean discharge in second-feet	1884 to Dec. 31, 1892.
14th A, pt. 2	Monthly discharge (long-time records, 1871 to 1893)	1888 to Dec. 31, 1893.
B 131	Descriptions, measurements, gage heights, and ratings	1893 and 1894.
16th A, pt. 2	Descriptive information only	
B 140	Descriptions, measurements, gage heights, ratings, and monthly discharge (also many data covering earlier years).	1895.
W 11	Gage heights (also gage heights for earlier years)	1896.
18th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also similar data for some earlier years).	1895 and 1896.
W 15	Descriptions, measurements, and gage heights, eastern United States, eastern Mississippi River, and Missouri River above junction with Kansas.	1897.
W 16	Descriptions, measurements, and gage heights, western Mississippi River below junction of Missouri and Platte, and western United States.	1897.
19th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also some long-time records).	1897.
W 27	Measurements, ratings, and gage heights eastern United States, eastern Mississippi River, and Missouri River.	1898.
W 28	Measurements, ratings, and gage heights, Arkansas River and western United States.	1898.
20th A, pt. 4	Monthly discharge (also for many earlier years)	1898.
W 35 to 39	Descriptions, measurements, gage heights, and ratings	1899.
21st A, pt. 4	Monthly discharge	1899.
W 47 to 52	Descriptions, measurements, gage heights, and ratings	1900.
22d A, pt. 4	Monthly discharge	1900.
W 65, 66	Descriptions, measurements, gage heights, and ratings	1901.
W 75	Monthly discharge	1901.
W 82 to 85	Complete data	1902.
W 97 to 100	do	1903.
W 124 to 135	do	1904.
W 165 to 178	do	1905.
W 201 to 214	do	1906.
W 241 to 252	do	1907–8.
W 261 to 272	do	1909.
W 281 to 292	do	1910.
W 301 to 312	do	1911.
W 321 to 332	do	1912.
W 351 to 362	do	1913.
W 381 to 394	do	1914.
W 401 to 414	do	1915.
W 431 to 444	do	1916.
W 451 to 464	do	1917.
W 471 to 484	do	1918.
W 501 to 514	do	1919–20.
W 521 to 534	do	1921.
W 541 to 554	do	1922.
W 561 to 574	do	1923.
W 581 to 594	do	1924.
W 601 to 614	do	1925.
W 621 to 634	do	1926.
W 641 to 654	do	1927.
W 661 to 674	do	1928.
W 681 to 694	do	1929.

Digitized by Google

The records at most of the stations discussed in these reports extend over a series of years. Miscellaneous measurements at many points other than regular gaging stations have been made each year and are published under "Miscellaneous discharge measurements" at the end of each report in the same relative order as the regular gaging stations. An index of the reports containing records obtained prior to 1904 has been published in Water-Supply Paper 119.

The following table gives, by years and drainage basins, the numbers of the papers on surface-water supply published from 1899 to 1929. The data for any particular station will, as a rule, be found in the reports covering the years during which the station was maintained. For example, data for 1910 to 1920 for any station in the area covered by Part III are published in Water-Supply Papers 283, 303, 323, 353, 383, 403, 433, 453, 473, and 503, which contain records for the Ohio River Basin for those years.

Digitized by Google

Numbers of water-supply papers containing results of stream measurements, 1899–1929

[For basins included see p. 5]

Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII-A	XII-B	XII-C
1899 [a]	35	[b] 35, 36	36	36	36	[a] 36, 37	37	37	[d] 37, 38	38, [a] 39	38, [f] 39	38	38	38
1900 [a]	47, [b] 48	48	48, [c] 49	49	49	49, [f] 50	50	50	50	51	51	51	51	51
1901	65, 75	65, 75	65, 75	65, 75	[b] 65, 66, 75	66, 75	[b] 65, 66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75
1902	82	[b] 82, 83	83	[f] 82, 83	[b] 83, 85	84	[b] 83, 84	84	85	85	85	85	85	85
1903	97	[b] 97, 98	98	97	[b] 98, 99, [m] 100	99	[b] 98, 99	99	100	100	100	100	100	100
1904	[m] 124, [a] 125 [p] 126	[p] 126, 127	128	129	[b] 128, 130	130, [a] 131	[b] 128, 131	132	133	133, [r] 134	134	135	135	135
1905	[m] 165, [a] 166 [p] 167	[p] 167, 168	169	170	171	172	[b] 169, 173	174	175, [a] 177	176, [r] 177	177	178	178	[t] 177, 178
1906	[m] 201, [a] 202, [p] 203	[p] 203, 204	205	206	207	208	[b] 205, 209	210	211, [a] 213	212, [r] 213	213	214	214	214
1907–8	241	242	243	244	245	246	247	248	249	250, [r] 251	251	252	252	252
1909	261	262	263	264	265	266	267	268	269	270, [r] 271	271	272	272	272
1910	281	282	283	284	285	286	287	288	289	290	291	292	292	292
1911	301	302	303	304	305	306	307	308	309	310	311	312	312	312
1912	321	322	323	324	325	326	328	328	329	330	331	332-A	332-B	332-C
1913	351	352	353	354	355	356	357	358	359	360	361	362-A	362-B	362-C
1914	381	382	383	384	385	386	387	388	389	390	391	392	393	394
1915	401	402	403	404	405	406	407	408	409	410	411	412	413	414
1916	431	432	433	434	435	436	437	438	439	440	441	442	443	444
1917	451	452	453	454	455	456	457	458	459	460	461	462	463	464
1918	471	472	473	474	475	476	477	478	479	480	481	482	483	484
1919–20	501	502	503	504	505	506	507	508	509	510	511	512	513	514
1921	521	522	523	524	525	526	527	528	529	530	531	532	533	534
1922	541	542	543	544	545	546	547	548	549	550	551	552	553	554
1923	561	562	563	564	565	566	567	568	569	570	571	572	573	574
1924	581	582	583	584	585	586	587	588	589	590	591	592	593	594
1925	601	602	603	604	605	606	607	608	609	610	611	612	613	614
1926	621	622	623	624	625	626	627	628	629	630	631	632	633	634
1927	641	642	643	644	645	646	647	648	649	650	651	652	653	654
1928	661	662	663	664	665	666	667	668	669	670	671	672	673	674
1929	681	682	683	684	685	686	687	688	689	690	691	692	693	694

[a] Rating tables and index to Water-Supply Papers 35–39 contained in Water-Supply Paper 39. Tables of monthly discharge for 1899 in Twenty-first Annual Report, Part IV.
[b] James River only.
[c] Gallatin River.
[d] Green and Gunnison Rivers and Grand River above junction with Gunnison.
[e] Mohave River only.
[f] Kings and Kern Rivers and South Pacific slope basins.
[g] Rating tables and index to Water-Supply Papers 47–52 and data on precipitation, wells and irrigation in California and Utah contained in Water-Supply Paper 52. Tables of monthly discharge for 1900 in Twenty-second Annual Report, Part IV.
[h] Wissahickon and Schuylkill Rivers to James River.
[i] Scioto River.
[j] Loup and Platte Rivers near Columbus, Nebr., and all tributaries below junction with Platte.
[k] Tributaries of Mississippi from east.
[l] Lake Ontario and tributaries of St. Lawrence River proper.
[m] Hudson Bay only.
[n] New England rivers only.
[o] Hudson River to Delaware River, inclusive.
[p] Susquehanna River to Yadkin River, inclusive.
[q] Platte and Kansas Rivers.
[r] Great Basin in California except Truckee and Carson River basins.
[s] Below junction with Gila.
[t] Rogue, Umpqua, and Siletz Rivers only.

Digitized by Google

COOPERATION

The legislature of Montana made an appropriation for stream-gaging work which was expended in cooperation with J. S. James, State engineer, largely in connection with the several Carey Act projects and irrigation districts in Montana. The work in the Milk River Basin was carried on jointly with the Dominion Water Power and Reclamation Service, Department of the Interior, Canada, under the Waterways Treaty. Financial assistance was also rendered by The Liberty-Montana Mines Co.

Officials of the Yellowstone National Park have furnished observers for gaging stations operated in the park and have paid for a part of the expense of the work.

In Wyoming the work was done in cooperation with the State through John A. Whiting, State engineer. The station on North Platte River at Wyoming-Nebraska line was also maintained in cooperation with the State of Nebraska through R. H. Willis, chief, Bureau of Irrigation, Power and Drainage, Department of Public Works. Financial assistance was rendered by the Bureau of Reclamation, the United States Indian Service, and the Midwest Refining Co.

In Colorado the work was carried on in cooperation with the State engineer, M. C. Hinderlider. Financial assistance was also rendered by the city of Loveland and Barton M. Jones.

In Kansas the work was done in cooperation with the Kansas Water Resources Division of the State Board of Agriculture, Geo. S. Knapp, chief engineer.

In Missouri and the station on Missouri River at Leavenworth, Kans., the work was carried on in cooperation with the Missouri Bureau of Geology and Mines, through H. A. Buehler, State Geologist. Financial assistance was also rendered by the Missouri Game and Fish Department, Chicago Great Western Railroad Co., Missouri Hydroelectric Power Co., and Gasconade River Power Co.

Acknowledgment is due also to the Corps of Engineers, U. S. Army, for financial assistance in collecting records published herein.

DIVISION OF WORK

Data for stations in the upper Missouri River and Yellowstone River Basins in Montana were collected and prepared for publication under the direction of W. A. Lamb, district engineer, assisted by A. H. Tuttle, C. S. Heidel, G. C. Sanders, W. J. Parsons, jr., and Mrs. G. Thompson.

Data for stations in Yellowstone National Park were collected and prepared for publication under the direction of C. G. Paulsen, district engineer, assisted by Berkeley Johnson, F. M. Veatch, M. C. Boyer, Miss E. H. Haugse, and Miss Josephine Ruick.

Digitized by Google

Data for stations in Colorado, Wyoming, South Dakota, and Nebraska were collected and prepared for publication under the direction of Robert Follansbee, district engineer, assisted by P. V. Hodges, F. F. Le Fever, R. E. Cabell, H. P. Eisenhuth, D. S. Jenkins, F. B. Campbell, Miss Nellie L. Esterly, and Mrs. Elsie L. Yeatman.

Data for stations in Kansas were collected and prepared for publication under the direction of J. B. Spiegel, district engineer, assisted by Charles Wells, W. M. Littlefield, R. V. Smrha, and Mrs. Maude Moon.

Data for stations in Missouri and for stations on Missouri River at Nebraska City, Nebr., and Leavenworth, Kans., were collected and prepared for publication under the direction of H. C. Beckman, district engineer, assisted by V. L. Austin, C. H. Jennings, H. C. Bolon, and R. D. Schmickel.

The records were reviewed and manuscript assembled by Warren Withee.

Digitized by Google

GAGING-STATION RECORDS

MISSOURI RIVER PROPER

RED ROCK RIVER AT METZEL FORD, NEAR MONIDA, MONT.

LOCATION.—Water-stage recorder near center of north line of sec. 34, T. 13 S., R. 3 W., 1 mile below Metzel Ford and 20 miles east of Monida.

RECORDS AVAILABLE.—April, 1925, to October, 1929; discontinued.

EXTREMES.—Maximum discharge during year, 400 second-feet May 17 (gage height, 3.75 feet); minimum, 5.6 second-feet Sept. 15 (gage height, 1.36 feet).

1925–1929: Maximum discharge, 586 second-feet May 17, 1927 (gage height, 4.20 feet); minimum, 2.7 second-feet Sept. 23, 1926 (gage height, 1.36 feet).

REMARKS.—Records fair. Discharge estimated July 18–26. Observations discontinued Oct. 1–8, Oct. 18 to May 15, and June 6–26. No diversions. Natural storage in Red Rock Lake.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	May	June	July	Aug.	Sept.	Oct.
1			179	71	16	14	21
2			143	66	16	11	33
3			146	60	15	8.8	32
4			149	53	16	12	27
5			152	52	16	13	32
6				46	15	14	30
7				36	15	15	33
8				32	16	14	39
9	17			47	16	14	40
10	12			43	14	14	42
11	11			38	14	13	36
12	11			31	13	13	46
13	11			34	11	9.6	47
14	11			35	10	8.8	47
15	11			32	10	7.4	45
16	8.6	347		31	9.6	10	47
17	7.4	378		26	8.0	14	45
18		362		26	8.8	13	37
19		368		25	10	13	39
20		301		24	10	14	36
21		280		23	8.8	20	
22		264		22	8.0	21	
23		250		21	9.6	22	
24		235		20	8.8	26	
25		223		20	7.4	28	
26		244		19	8.0	32	
27		246	82	19	7.4	30	
28		227	87	17	8.8	31	
29		205	82	17	12	31	
30		201	80	17	12	32	
31		201		15	14		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1928–29				
October 9–17	17	7.4	11.1	198
May 16–31	378	201	270	8,570
July	71	15	32.8	2,020
August	16	7.4	11.7	719
September	32	7.4	17.3	1,030
1929				
October 1–20	47	27	38.2	1,520

Digitized by Google

RED ROCK RIVER BELOW RED ROCK RESERVOIR, NEAR MONIDA, MONT.

LOCATION.—Staff gage in SW. ¼ sec. 32, T. 13 S., R. 6 W., just below Red Rock Reservoir, 8 miles northwest of Monida.

RECORDS AVAILABLE.—July, 1911, to September, 1918; May, 1925, to September, 1929.

EXTREMES.—Maximum discharge during year, 683 second-feet May 12 and 13 (gage height, 2.35 feet); minimum, 20 second-feet Mar. 24 and 29 (gage height, 0.20 foot).

1911–1918, 1925–1929: Maximum discharge, 1,220 second-feet Apr. 28, 1914 (gage height, 3.2 feet); minimum, 5 second-feet Jan. 1 to Apr. 10, 1913 (gage height, 0.10 foot).

REMARKS.—Records good. Observations discontinued Dec. 16 to Mar. 23. No diversions above station. Flood water stored in reservoir.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	38	59	------	21	414	227	479	34	102
2	22	38	61	------	21	523	227	457	34	102
3	23	58	59	------	21	546	227	479	35	99
4	23	73	51	------	21	546	227	457	35	97
5	23	73	38	------	20	568	211	435	34	90
6	23	78	34	------	21	591	211	457	34	85
7	22	78	34	------	21	614	211	479	34	80
8	22	78	34	------	22	637	211	479	34	73
9	22	75	34	------	22	660	211	479	34	68
10	22	75	34	------	22	660	211	501	56	66
11	23	75	34	------	22	660	211	334	78	64
12	23	75	34	------	22	683	211	211	78	61
13	23	75	34	------	22	683	211	211	78	59
14	22	75	34	------	22	660	211	211	78	58
15	22	76	34	------	22	660	211	211	78	55
16	23	76	------	------	22	614	211	211	78	51
17	23	75	------	------	22	523	196	211	78	45
18	23	71	------	------	22	457	314	211	92	41
19	23	70	------	------	22	414	314	211	106	35
20	22	68	------	------	22	393	260	211	104	34
21	22	68	------	------	27	334	211	211	106	34
22	22	64	------	------	34	314	211	211	106	32
23	21	61	------	------	48	296	196	211	106	31
24	21	61	------	20	71	277	196	211	106	21
25	23	61	------	21	92	243	196	211	106	29
26	24	64	------	21	104	227	169	109	104	28
27	27	64	------	21	117	243	227	38	104	27
28	28	64	------	21	156	243	393	37	102	27
29	32	61	------	20	227	227	373	37	104	26
30	35	61	------	21	296	227	414	35	102	24
31	37	------	------	21	------	227	------	34	102	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	37	21	24.0	1,480
November	78	38	67.6	4,020
December 1–15	61	34	40.5	1,200
March 24–31	21	20	20.8	330
April	296	20	53.5	3,180
May	683	227	463	28,500
June	414	169	239	14,200
July	501	34	267	16,400
August	106	34	76.1	4,680
September	102	24	55.1	3,280

Digitized by Google

BEAVERHEAD RIVER AT BARRATTS, MONT.

LOCATION.—Chain gage in SE. ¼ SW. ¼ sec. 20, T. 8 S., R. 9 W., 1 mile above Barratts and 10 miles southwest of Dillon.

DRAINAGE AREA.—2,850 square miles.

RECORDS AVAILABLE.—August, 1907, to September, 1929.

EXTREMES.—Maximum discharge during year, 952 second-feet June 18 (gage height, 2.30 feet); minimum, 168 second-feet Aug. 30 to Sept. 4 (gage height, 0.60 foot).

1907–1929: Maximum discharge, 3,640 second-feet June 19 and 20, 1908 (gage height, 6.0 feet); minimum, 106 second-feet July 28, 29, Aug. 19–31, Sept. 1, and 10–17, 1919 (gage height, 0.50 foot).

REMARKS.—Records good. Observations discontinued Jan. 1 to Mar. 9. Numerous diversions above station. Flow regulated by storage in Red Rock Reservoir.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	180	264	358	----	338	568	338	230	230	168
2	180	264	338	----	379	568	338	230	230	168
3	180	264	338	----	423	568	338	198	230	168
4	180	264	319	----	494	780	338	198	230	168
5	186	300	319	----	543	780	338	230	264	180
6	186	319	319	----	423	780	300	230	247	180
7	186	358	319	----	423	836	300	230	247	180
8	186	358	319	----	379	894	300	230	230	180
9	186	358	319	----	379	894	300	264	230	180
10	186	379	319	338	338	894	300	264	230	186
11	192	379	319	300	338	836	470	230	230	186
12	192	379	319	300	338	836	620	230	230	186
13	211	379	319	300	338	836	620	230	230	186
14	224	379	300	338	338	894	568	338	230	186
15	224	358	300	300	338	836	568	338	230	186
16	224	358	300	300	379	836	620	338	230	186
17	224	358	300	300	423	836	894	338	198	186
18	230	358	300	338	518	726	952	338	198	186
19	230	358	300	338	518	726	894	470	198	186
20	230	358	300	338	518	620	726	518	198	186
21	247	358	300	338	518	568	518	470	198	186
22	247	358	300	338	470	568	423	423	198	186
23	247	358	300	338	518	518	379	379	192	186
24	264	358	282	338	518	568	379	338	192	186
25	264	358	282	300	423	518	319	319	192	198
26	264	358	264	300	423	518	264	300	183	198
27	247	358	264	319	518	726	264	300	180	264
28	247	358	264	358	518	726	264	300	180	282
29	247	358	264	379	518	568	264	264	180	247
30	264	358	264	338	568	518	264	264	168	247
31	264	----	264	338	----	338	----	264	168	----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	264	180	220	13,500
November	379	264	346	20,600
December	358	264	302	18,600
March 10–31	379	300	326	14,200
April	568	338	439	26,100
May	894	338	699	43,000
June	952	264	449	26,700
July	518	198	300	18,400
August	264	168	212	13,000
September	282	168	193	11,500

Digitized by Google

JEFFERSON RIVER NEAR SILVERSTAR, MONT.

LOCATION.—Cable gage in SE. ¼ sec. 23, T. 2 S., R. 6 W., at highway bridge 5 miles southwest of Silverstar and 5 miles below junction of Beaverhead and Big Hole Rivers.

DRAINAGE AREA.—7,840 square miles.

RECORDS AVAILABLE.—August, 1910, to September, 1916; July, 1920, to September, 1929.

EXTREMES.—Maximum discharge during year, 7,800 second-feet June 19 (gage height, 5.70 feet); minimum, 122 second-feet Aug. 23 (gage height, 1.28 feet).

1910–1916, 1920–1929: Maximum discharge, 19,800 second-feet June 15, 1927 (gage height, 9.85 feet); minimum, that of Aug. 23, 1929.

REMARKS.—Records good. Observations discontinued Dec. 16 to Mar. 13. Numerous diversions. Flow partly regulated by two reservoirs upstream.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	712	970	1,080		1,200	3,420	2,600	2,000	383	170
2	712	970	1,080		1,200	2,600	3,000	1,770	369	170
3	712	1,080	1,080		1,200	2,800	3,210	1,540	363	179
4	712	1,080	1,140		1,260	2,800	3,210	1,470	363	196
5	712	1,140	1,140		1,400	2,800	2,800	1,400	363	201
6	712	1,200	1,200		1,330	2,800	3,000	1,260	356	239
7	712	1,200	1,200		1,260	2,240	3,000	1,140	349	272
8	860	1,140	1,200		1,200	2,240	3,640	1,080	337	337
9	860	1,140	1,200		1,260	2,410	4,090	1,140	325	349
10	915	1,200	1,200		1,140	2,410	4,320	1,080	318	447
11	1,020	1,200	1,200		1,080	2,410	4,550	1,020	300	492
12	915	1,200	1,200		1,080	2,410	4,780	970	261	492
13	915	1,140	1,140		1,080	2,600	4,780	860	239	477
14	915	1,140	1,140	1,140	1,080	3,000	5,010	860	239	492
15	970	1,140	1,200	1,140	1,080	3,000	5,010	915	239	462
16	970	1,200		1,080	1,020	3,000	5,240	860	220	477
17	1,020	1,200		1,020	1,140	3,210	6,730	810	211	477
18	1,020	1,200		1,080	1,140	3,210	7,530	810	196	462
19	1,020	1,200		1,080	1,620	3,210	7,800	810	183	462
20	970	1,200		1,080	2,000	3,420	6,730	915	175	477
21	970	1,200		1,080	2,160	3,420	5,480	915	162	534
22	970	1,200		1,080	2,000	3,640	4,780	860	158	534
23	970	1,200		1,140	2,160	3,860	3,860	810	122	575
24	970	1,200		1,080	2,410	4,780	3,420	620	142	665
25	970	1,200		1,080	2,240	5,240	3,000	620	146	712
26	970	1,200		1,080	2,240	5,240	2,800	575	162	760
27	970	1,200		1,140	2,600	4,780	2,600	469	162	810
28	970	1,140		1,140	3,000	4,320	2,240	455	170	860
29	970	1,020		1,140	4,090	3,640	2,160	405	175	915
30	1,020	1,080		1,470	4,320	3,420	2,160	390	175	860
31	915			1,330		2,800		390	175	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,020	712	904	55,600
November	1,200	970	1,150	68,400
December 1-15	1,200	1,080	1,160	34,500
March 14-31	1,470	1,020	1,130	40,300
April	4,320	1,020	1,730	103,000
May	5,240	2,240	3,260	200,000
June	7,800	2,160	4,120	245,000
July	2,000	390	943	58,000
August	383	122	243	14,900
September	915	170	485	28,900

Digitized by Google

MISSOURI RIVER BELOW HAUSER LAKE DAM, NEAR HELENA, MONT.

LOCATION.—Water-stage recorder in SW. ¼ sec. 29, T. 12 N., R. 2 W., at Hauser Lake power plant 15 miles northeast of Helena.

DRAINAGE AREA.—16,600 square miles.

RECORDS AVAILABLE.—December, 1922, to September, 1929.

EXTREMES.—Maximum discharge during year, 18,000 second-feet June 19 (gage height, 74.20 feet); minimum, 875 second-feet Dec. 25 (gage height, 66.05 feet).

1922–1929: Maximum discharge, 33,300 second-feet June 14, 15, and 18, 1927 (gage height, 78.80 feet); minimum, 500 second-feet Sept. 14, 1924 (gage height, 65.40 feet).

REMARKS.—Records good. Numerous diversions. Flow partly regulated by reservoirs and power plants above station. Complete records furnished by Montana Power Co.

Daily and monthly discharge, in second-feet, 1928-29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,600	4,540	4,390	4,380	4,340	4,220	4,910	7,040	9,140	6,530	3,660	3,900
2	3,920	4,440	2,670	4,420	4,240	4,040	4,940	8,380	8,630	5,870	3,840	1,200
3	3,920	4,380	4,400	4,460	2,760	4,240	4,900	8,140	8,400	6,600	3,460	3,100
4	4,100	4,080	4,500	4,260	4,140	4,280	4,860	7,470	8,890	4,330	1,200	4,440
5	4,420	3,740	4,320	4,440	4,320	4,550	4,880	7,030	9,060	3,330	2,410	4,460
6	4,170	3,480	3,600	4,440	4,290	5,090	4,880	6,590	8,840	4,230	3,680	4,460
7	3,080	3,600	3,760	4,440	4,260	5,520	4,820	6,470	8,210	3,000	4,300	4,460
8	3,240	3,800	4,480	4,420	4,230	5,930	4,760	6,270	6,490	4,200	3,120	3,420
9	3,560	4,080	2,440	3,800	4,200	5,040	4,860	5,990	6,830	3,850	3,680	4,360
10	4,320	4,200	2,180	4,100	3,580	4,410	4,820	5,890	7,840	3,620	3,980	4,510
11	4,410	3,560	3,180	4,340	3,180	4,180	4,810	5,830	8,680	3,720	3,340	4,480
12	4,560	4,080	4,220	4,410	3,340	4,540	4,810	5,360	9,230	3,250	3,320	4,480
13	4,360	4,460	4,250	3,380	3,560	4,600	4,840	5,490	8,600	3,450	3,860	4,480
14	2,260	3,920	4,460	3,680	3,960	4,740	4,820	5,810	8,090	4,350	4,240	4,500
15	2,900	3,760	4,410	4,460	4,060	4,540	4,540	5,850	9,370	3,620	4,180	4,520
16	3,870	4,380	4,080	4,460	4,100	4,430	4,600	6,110	11,400	3,500	4,440	4,480
17	3,760	4,400	4,010	4,460	3,560	4,220	4,650	6,390	13,000	3,820	4,080	4,480
18	3,900	3,460	4,460	4,470	4,000	4,580	4,700	6,710	13,800	4,340	1,540	4,530
19	3,600	3,650	4,460	4,440	4,100	4,520	4,860	6,270	14,800	3,960	3,060	4,500
20	3,780	4,470	4,380	4,470	4,100	4,520	5,080	8,120	14,800	3,780	4,160	4,480
21	2,720	4,470	3,840	4,400	4,100	4,580	4,940	8,800	13,400	2,220	4,440	4,500
22	4,400	3,910	3,820	4,470	4,080	4,710	4,640	8,160	11,500	2,820	4,180	4,200
23	4,360	4,340	3,930	4,470	4,050	4,620	4,880	8,160	10,500	3,880	4,510	3,740
24	4,590	4,280	3,040	4,460	4,060	4,580	5,040	8,240	7,700	3,420	4,420	4,500
25	4,580	3,390	1,180	4,460	4,100	4,560	5,260	9,780	5,770	3,720	2,120	4,530
26	4,580	3,820	2,790	4,470	4,160	4,480	5,490	10,600	5,610	4,060	3,620	4,270
27	4,530	4,500	3,740	4,470	4,170	4,520	5,690	11,700	6,550	4,300	4,360	4,330
28	3,640	4,100	4,380	4,400	4,200	4,640	6,090	13,300	6,650	3,000	4,420	4,500
29	3,880	4,120	4,380	4,420	------	4,560	5,970	12,500	7,640	2,520	4,420	4,340
30	4,560	4,390	3,500	4,420	------	4,650	6,470	11,200	7,010	3,300	4,420	4,160
31	4,560	------	3,550	4,380	------	4,260	------	10,100	------	3,680	4,420	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	4,590	2,260	3,940	242,000
November	4,540	3,390	4,060	242,000
December	4,500	1,180	3,770	232,000
January	4,470	3,380	4,340	267,000
February	4,340	2,760	3,970	220,000
March	5,930	4,040	4,590	282,000
April	6,470	4,540	5,030	299,000
May	13,300	5,360	7,860	483,000
June	14,800	5,610	9,210	548,000
July	6,600	2,220	3,880	239,000
August	4,510	1,200	3,710	228,000
September	4,530	1,200	4,210	251,000
The year	14,800	1,180	4,880	3,530,000

Digitized by Google

MISSOURI RIVER AT FORT BENTON, MONT.

LOCATION.—Water-stage recorder in NE. ¼ sec. 26, T. 24 N., R. 8 E. at highway bridge at Fort Benton.

DRAINAGE AREA.—24,600 square miles.

RECORDS AVAILABLE.—July, 1881, to November, 1891; July, 1902, to September, 1929.

EXTREMES.—Maximum discharge during year, 20,800 second-feet May 29, 30, and June 2 and 19 (gage height, 5.5 feet); minimum, 3,030 second-feet Aug. 13 (gage height, 0.96 foot).

1881–1891, 1902–1929: Maximum discharge, 107,000 second-feet June 7, 1908 (gage height, 16.3 feet); minimum, 1,420 second-feet Aug. 17, 1919. Prior to 1918 open-season records only were obtained; discharge may have been lower during winter.

REMARKS.—Records good except those for period of ice effect, Nov. 29 to Mar. 18, which are fair. Discharge determined from flow at Volta power plant Oct. 16 to Nov. 8 and Nov. 28 to May 16. Numerous diversions from tributaries. Flow partly regulated by storage in reservoirs.

Daily and monthly discharge, in second-feet, 1928-29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5,500	4,820	4,350	4,970	4,740	5,320	6,140	9,480	19,100	10,500	4,560	4,860
2	5,500	5,090	4,790	4,250	4,950	5,330	5,780	7,810	20,800	10,500	4,600	4,260
3	5,530	5,030	4,480	4,370	5,220	5,390	5,510	9,180	20,200	8,900	4,720	4,800
4	5,630	5,030	3,820	5,030	5,390	4,730	5,480	13,000	19,100	8,000	4,800	4,890
5	5,950	4,910	3,780	5,090	4,960	5,380	5,390	12,600	18,000	8,180	4,330	4,950
6	5,960	4,980	5,090	4,850	5,050	5,720	5,510	11,700	16,400	8,180	4,720	4,900
7	5,940	5,210	5,930	3,760	5,030	5,660	5,750	10,300	16,400	6,080	4,980	5,100
8	5,130	5,150	5,750	4,790	5,210	5,950	5,230	9,970	16,400	6,250	4,600	4,920
9	5,780	5,370	5,330	5,090	5,500	6,090	5,780	9,340	16,400	6,420	4,790	4,500
10	5,580	5,820	4,970	5,690	5,720	5,650	5,310	8,740	14,900	6,590	4,800	5,270
11	5,560	5,440	5,600	5,030	4,940	4,850	5,560	9,340	14,900	5,920	4,510	4,970
12	5,550	5,500	5,570	5,030	5,500	5,660	5,880	9,800	15,900	6,080	3,680	4,960
13	5,780	5,660	4,820	4,990	5,710	6,030	6,000	9,360	15,900	5,600	4,730	5,650
14	5,830	5,710	4,720	4,760	5,490	5,690	5,780	9,430	15,400	5,790	4,570	5,040
15	5,560	5,900	4,940	4,850	5,380	5,520	5,900	10,500	15,900	4,090	4,420	4,660
16	5,320	5,330	4,910	4,670	5,340	5,550	5,870	11,100	13,600	5,500	5,040	4,310
17	5,140	5,760	4,310	4,010	5,350	5,450	6,000	11,300	14,700	5,350	4,110	5,300
18	5,090	5,630	4,540	4,790	4,900	5,390	6,200	11,300	19,100	4,920	4,780	5,130
19	5,080	5,580	5,030	4,910	5,450	5,690	6,400	12,100	20,200	4,790	4,380	5,230
20	5,030	5,590	4,160	4,410	5,350	5,640	6,450	14,900	19,600	5,200	4,690	5,280
21	5,320	5,430	4,940	4,160	5,270	6,100	6,110	15,900	19,100	5,170	4,690	5,230
22	5,000	5,660	5,510	4,880	5,210	5,990	5,740	17,400	18,600	4,300	4,590	4,640
23	5,040	5,660	5,330	5,030	5,310	5,930	6,280	19,100	16,900	4,830	4,840	5,090
24	5,140	5,500	5,330	5,300	5,270	5,330	6,430	19,600	15,900	4,770	4,670	5,270
25	4,840	5,590	5,330	5,090	4,520	4,730	7,040	20,200	14,900	4,800	4,330	5,400
26	4,850	5,170	5,270	4,610	5,330	5,800	8,640	18,600	11,800	4,520	4,400	5,070
27	5,020	5,380	5,160	5,060	5,330	5,890	8,260	15,900	8,710	4,730	4,970	5,750
28	5,470	5,890	5,230	4,790	5,200	5,210	7,760	18,000	7,040	4,620	4,700	5,500
29	4,370	4,970	5,300	5,450	.....	5,450	8,300	20,800	8,760	3,850	4,930	4,770
30	5,120	4,850	5,150	4,820	.....	6,120	9,280	20,800	10,500	4,280	4,790	5,090
31	4,910	.....	4,670	4,970	.....	6,560	.....	19,100	.....	4,450	4,910	.....

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	5,960	4,370	5,340	328,000
November	5,900	4,820	5,390	321,000
December	5,930	3,780	4,990	307,000
January	5,690	3,760	4,820	296,000
February	5,720	4,520	5,240	291,000
March	6,560	4,730	5,610	345,000
April	9,280	5,230	6,330	377,000
May	20,800	7,810	13,400	824,000
June	20,800	7,040	15,800	940,000
July	10,500	3,850	5,910	363,000
August	5,040	3,680	4,640	285,000
September	5,750	4,260	5,030	299,000
The year	20,800	3,680	6,880	4,980,000

Digitized by Google

MISSOURI RIVER NEAR WILLISTON, N. DAK.

LOCATION.—Water-stage recorder in sec. 31, T. 154 N., R. 101 W., at Lewis and Clark Highway bridge 7 miles west of Williston.

RECORDS AVAILABLE.—September, 1928, to September, 1929.

EXTREMES.—Maximum discharge during period, 109,000 second-feet June 8; maximum stage, 16.4 feet Mar. 22, caused by ice gorge. Minimum discharge (estimated), 5,650 second-feet Jan. 30 and 31.

REMARKS.—Records good except those for period of ice effect, Nov. 30 to Mar. 9, which are fair. Discharge estimated Sept. 16, 23, 30, Oct. 7, 14, 1928, and June 29 to July 5, July 7–11, 13–18, and 20–22, 1929. Observations discontinued Mar. 10–23. Numerous diversions above station. Several storage reservoirs on tributaries.

Daily and monthly discharge, in second-feet, 1928–29

Day	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-------	14,000	15,400	12,300	13,100	5,910	8,380	45,000	27,200	76,100	55,300	12,300	8,380
2	-------	14,000	14,700	12,300	13,400	6,100	8,720	52,400	28,700	58,300	56,300	11,800	8,380
3	-------	13,400	14,700	12,300	13,400	6,100	9,080	52,400	30,200	54,400	57,300	11,800	8,720
4	-------	13,400	14,700	12,300	13,100	6,400	9,080	38,000	28,700	54,400	58,300	11,300	9,080
5	-------	13,400	14,000	11,800	12,000	6,510	9,080	30,200	30,200	56,400	59,300	10,800	9,080
6	-------	13,400	14,700	11,800	11,300	6,730	9,080	30,200	31,700	66,500	60,200	10,300	9,080
7	-------	13,400	14,700	11,800	10,400	6,830	9,080	33,200	31,700	84,200	57,100	10,800	9,080
8	-------	13,400	14,000	11,800	9,660	6,730	9,460	34,800	27,200	105,000	54,000	10,800	9,460
9	-------	13,400	13,400	11,300	9,080	7,100	10,800	38,000	27,200	72,100	50,900	10,800	10,300
10	-------	13,400	14,000	10,800	8,380	7,480	-------	31,700	30,200	60,200	47,800	10,800	10,800
11	-------	13,400	14,000	9,460	7,910	8,060	-------	24,500	33,200	64,200	44,700	10,800	11,300
12	-------	13,400	13,400	9,080	8,220	8,550	-------	23,200	31,700	84,200	41,500	10,800	12,900
13	-------	13,400	13,400	9,080	8,380	9,080	-------	20,800	31,700	86,300	39,700	10,300	13,400
14	15,400	13,700	13,400	10,300	8,380	9,270	-------	19,800	25,800	84,200	38,900	9,870	13,400
15	15,400	14,000	13,400	11,300	8,220	8,900	-------	17,800	23,200	84,200	37,000	10,800	13,400
16	15,800	14,700	13,400	11,800	8,720	8,720	-------	18,700	19,800	82,200	35,200	10,800	13,400
17	16,100	14,700	13,400		9,080	8,720	-------	18,700	19,800	80,200	33,400	9,870	13,400
18	15,400	14,700	13,400		9,080	8,900	-------	18,700	19,800	78,100	31,500	9,460	12,900
19	15,400	14,700	13,400		9,460	9,270	-------	17,800	22,000	80,200	28,700	9,080	12,300
20	15,400	15,400	12,900		9,660	9,270	-------	17,800	27,200	80,200	28,000	9,080	12,300
21	15,400	16,100	13,400		9,270	9,460	-------	17,800	31,700	82,200	27,200	8,720	12,300
22	15,400	16,100	13,400		8,900	9,460	-------	18,700	38,000	76,100	26,500	8,380	12,300
23	14,700	16,100	13,400		8,380	9,660	-------	18,700	38,000	62,200	25,800	8,380	12,300
24	14,700	16,900	13,400	12,000	7,910	9,460	97,300	19,800	39,800	58,300	25,800	8,380	12,300
25	14,000	17,800	12,900		7,350	9,460	62,200	20,800	43,200	56,400	23,200	8,380	12,900
26	14,000	16,900	12,900		6,850	9,080	48,600	23,200	54,400	54,400	20,800	8,380	13,400
27	14,000	16,100	12,900		6,510	8,900	39,800	24,500	68,100	52,400	17,800	8,380	13,400
28	14,000	16,100	12,900		6,300	8,720	36,400	24,500	76,100	52,400	15,400	8,380	13,400
29	13,400	16,100	12,300		5,820	-------	56,600	24,500	86,300	53,400	15,400	8,060	14,000
30	13,700	15,400	12,300		5,650	-------	55,700	27,200	88,300	54,400	13,400	8,380	14,700
31	-------	15,400	-------		5,650	-------	39,800	-------	92,400	-------	12,900	8,380	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1928				
September 14–30	16,100	13,400	14,800	499,000
1928–29				
October	17,800	13,400	14,700	904,000
November	15,400	12,300	13,600	809,000
December	----------	----------	11,600	713,000
January	13,400	5,650	9,020	555,000
February	9,660	5,910	8,170	454,000
April	52,400	17,800	26,800	1,590,000
May	92,400	19,800	38,800	2,390,000
June	105,000	52,400	69,800	4,150,000
July	60,200	12,900	36,800	2,260,000
August	12,300	8,060	9,820	604,000
September	14,700	8,380	11,700	696,000

Digitized by Google

MISSOURI RIVER AT SANISH, N. DAK.

LOCATION.—Wire gage in sec. 14, T. 152 N., R. 93 W., at highway bridge at Sanish.

RECORDS AVAILABLE.—September, 1928, to September, 1929.

EXTREMES.—Maximum discharge during period, 90,000 second-feet June 9; maximum stage, 14.2 feet Mar. 19, caused by ice gorge. Minimum discharge (estimated), 5,180 second-feet Feb. 3.

REMARKS.—Records good except those for period of ice effect, Nov. 19 to Mar. 10, which are fair. Discharge not determined Mar. 11–25. Numerous diversions above station. Several storage reservoirs on tributaries.

Daily and monthly discharge, in second-feet, 1928–29

Day	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		13,500	15,400	12,300		5,720	9,260	38,800	32,000	74,600	57,400	15,400	8,000
2		13,500	15,400	12,300		5,440	8,820	50,900	33,100	65,200	58,700	14,100	8,400
3		13,500	15,400	12,300	11,000	5,180	8,820	48,400	34,200	61,300	58,700	13,500	8,820
4		13,500	15,400	11,700		5,440	8,820	41,200	34,200	61,300	58,700	12,300	8,820
5		14,100	14,700	11,200		5,720	10,200	36,400	35,300	65,200	53,500	11,700	8,820
6		14,100	14,700	12,300	10,200	6,600	10,200	33,100	36,400	70,400	52,200	11,200	8,400
7		13,500	14,100	12,300	10,200	6,600	9,700	29,800	36,400	74,600	49,600	11,200	9,260
8		13,500	14,700	12,300	9,700	6,300	8,820	35,300	37,600	83,000	49,600	10,700	8,820
9		13,500	14,700	12,300	9,700	6,300	8,820	34,200	38,800	90,000	47,200	10,700	9,260
10		13,500	14,700	11,200	9,700	6,300	9,260	33,100	34,200	67,800	44,800	9,700	9,260
11		13,500	14,700	10,700	8,820	6,300		35,300	36,400	63,900	42,400	11,200	11,200
12		13,500	14,700	10,200	8,400	6,600		28,700	37,600	77,400	41,200	10,700	11,200
13		13,500	14,700	10,200	9,260	6,920		27,600	37,600	84,400	37,600	10,200	12,900
14		13,500	14,100	10,200	8,820	7,260		25,500	34,200	78,800	36,400	10,200	12,900
15		12,900	14,100	9,700	8,820	8,400		23,500	30,900	77,400	32,000	10,200	14,100
16		12,900	14,100	9,260	8,820	8,400		23,500	30,900	73,200	29,800	10,200	13,500
17		14,100	14,100	9,260	8,820	8,400		22,500	29,800	71,800	26,600	10,200	13,500
18		14,700	14,100	9,700	8,820	8,820		20,700	28,700	76,000	26,600	9,700	12,900
19		14,700	14,100	9,700	8,400	8,820		20,700	28,700	76,000	28,700	9,700	12,900
20		15,400	14,100		8,400	8,820		20,700	29,800	77,400	27,600	9,260	12,900
21		15,400	13,500		8,820	8,820		19,900	37,600	78,800	26,600	9,260	12,300
22		16,100	14,100		9,700	8,400		20,700	42,400	73,200	29,800	8,820	12,900
23	15,400	16,100	14,100		9,700	8,000		21,600	46,000	66,500	29,800	8,400	14,100
24	14,700	16,800	13,500		9,260	9,700		22,500	47,200	61,300	26,600	8,000	14,100
25	14,100	16,800	13,500	10,000	8,820	9,700		23,500	47,200	58,700	25,500	8,400	13,500
26	13,500	17,600	13,500		8,400	9,700	85,800	26,600	50,900	57,400	23,500	8,400	12,900
27	13,500	18,300	13,500		8,400	9,700	63,900	28,700	62,600	58,700	23,500	8,400	12,300
28	13,500	17,600	13,500		8,400	9,260	50,900	29,800	67,800	54,800	21,600	8,000	12,900
29	13,500	16,800	13,500		7,260	------	41,200	32,000	71,800	53,500	21,600	8,000	13,500
30	13,500	16,100	12,900		7,260	------	63,900	33,100	74,600	52,200	16,800	7,620	14,100
31		16,100	------		6,920	------	52,200	------	84,400	------	16,800	8,000	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1928				
September 23–30	15,400	13,500	14,000	222,000
1928–29				
October	18,300	12,900	14,800	910,000
November	15,400	12,900	14,300	851,000
December	------	------	10,600	652,000
January	------	------	9,190	565,000
February	9,700	5,180	7,560	420,000
April	50,900	19,900	29,600	1,760,000
May	84,400	28,700	42,200	2,590,000
June	90,000	52,200	69,500	4,140,000
July	58,700	16,800	36,200	2,230,000
August	15,400	7,620	10,100	621,000
September	14,100	8,000	11,600	690,000

Digitized by Google

MISSOURI RIVER AT BISMARCK, N. DAK.

LOCATION.—Water-stage recorder in sec. 31, T. 139 N., R. 80 W., at city water plant at Bismarck. Prior to Oct. 17, 1928, a chain gage at railroad bridge 0.4 mile upstream was used.

DRAINAGE AREA.—187,280 square miles.

RECORDS AVAILABLE.—September, 1904, to December, 1905; October, 1927, to September, 1929.

EXTREMES.—Maximum discharge during year, 112,000 second-feet June 10; maximum stage, 17.8 feet Mar. 27, caused by ice gorge; minimum discharge (estimated), 5,800 second-feet Feb. 5-7.

1927–1929: Maximum discharge, 201,000 second-feet Mar. 24, 1928; maximum stage, that of Mar. 27, 1929; minimum discharge, that of Feb. 5–7, 1929.

REMARKS.—Records good except those for period of ice effect, Dec. 2 to Mar. 28, which are fair. Numerous diversions above station. Tributaries partly regulated by storage reservoirs.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13,400	17,600	12,400		7,120	10,200	59,500	31,700	97,400	50,200	21,900	10,200
2	13,400	17,200	12,000		6,740	10,200	52,600	33,900	97,400	53,300	20,700	9,850
3	13,400	16,800	11,400		6,080	9,600	56,700	33,900	87,600	58,100	19,500	9,850
4	14,000	16,400	11,400		6,080	9,040	60,900	33,900	72,400	58,100	18,400	9,850
5	14,000	16,400	11,400		5,800	9,040	54,000	32,800	63,300	56,500	17,900	9,850
6	14,000	15,600	10,800	12,000	5,800	9,040	46,100	33,900	63,300	58,100	16,900	9,850
7	14,000	15,600	12,000		5,800	9,600	38,600	33,900	68,700	54,900	16,400	9,850
8	14,000	15,600	11,400		6,080	9,600	33,900	33,900	76,100	50,200	15,400	9,850
9	14,000	15,600	11,400		6,080	9,600	36,200	35,100	95,400	48,700	15,400	9,850
10	14,000	16,000	11,400		6,400	10,200	43,600	35,100	105,000	47,200	14,900	9,850
11	13,400	16,000	10,200	11,300	6,400	10,200	42,300	31,700	83,700	44,300	14,400	9,850
12	13,400	15,600	9,040	10,800	6,740	10,800	38,600	32,800	63,300	40,300	14,400	9,850
13	12,800	15,600	9,040	10,200	6,740	11,400	32,800	36,200	66,800	36,600	14,400	10,200
14	12,800	15,600	9,040	9,600	7,120	12,000	30,600	38,600	79,900	35,500	14,000	10,600
15	12,800	15,600	9,600	9,040	7,540	13,400	27,300	37,400	78,000	33,300	14,000	11,000
16	12,800	16,000	9,600	8,500	8,500		25,300	33,900	72,400	31,300	14,000	11,400
17	12,800	15,600	10,200	8,500	10,200		24,300	32,800	70,500	29,500	13,500	12,200
18	13,700	14,800	10,200	8,500	10,500		23,800	31,700	70,500	27,700	13,100	12,600
19	14,100	14,800	9,040	8,500	10,800		23,300	30,600	68,700	26,900	13,100	13,100
20	14,800	14,400	8,000	8,500	10,800		23,800	30,600	72,400	26,100	13,500	12,600
21	15,200	14,800	8,000	9,040	10,800		22,400	29,500	78,000	26,900	13,100	12,600
22	15,200	13,700		9,600	9,600	15,200	22,800	31,700	81,800	27,700	12,200	12,600
23	15,600	13,700		9,600	10,200		22,300	33,900	79,900	27,700	11,800	12,200
24	16,000	13,400		10,200	9,600		23,800	38,600	68,700	28,600	11,400	12,200
25	16,400	13,400		10,800	10,200		24,300	41,100	61,500	30,400	11,000	12,200
26	16,800	14,400	8,000	11,400	10,200		25,300	41,100	58,100	29,500	10,600	12,200
27	17,200	14,400		11,400	10,200		26,300	38,600	56,500	27,700	10,200	12,200
28	17,600	13,700		10,200	10,800		27,300	62,300	53,300	27,700	10,200	12,200
29	18,000	13,000		9,600	-------	77,300	28,400	74,200	51,700	26,900	10,200	11,800
30	18,000	13,000		9,040	-------	52,600	31,700	83,800	51,700	25,400	10,200	11,800
31	18,000	-------		8,000	-------	62,300	-------	93,900	-------	23,200	10,200	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	18,000	12,800	14,700	904,000
November	17,600	13,000	15,100	898,000
December	-------	-------	9,600	590,000
January	-------	-------	10,400	640,000
February	10,800	5,800	8,180	454,000
March	77,300	9,040	17,500	1,080,000
April	60,900	22,300	34,300	2,040,000
May	93,900	29,500	40,100	2,470,000
June	105,000	51,700	73,100	4,350,000
July	58,100	23,200	37,700	2,320,000
August	21,900	10,200	14,100	867,000
September	13,100	9,850	11,100	660,000
The year	105,000	5,800	23,900	17,300,000

Digitized by Google

MISSOURI RIVER NEAR MOBRIDGE, S. DAK.

LOCATION.—Chain gage in sec. 7, T. 18 N., R. 30 E., 3 miles west of Mobridge. Prior to March 28, 1929, station was 5 miles upstream in sec. 29, T. 19 N., R. 30 E., above mouth of Grand River, but records include flow of the Grand River, as discharge measurements for that station were made at site of present station. Zero of present gage is 1,529.25 feet above mean sea level.

DRAINAGE AREA.—209,000 square miles.

RECORDS AVAILABLE.—August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 164,000 second-feet Mar. 29 (gage height, 11.4 feet); minimum occurred during winter.

REMARKS.—Records good except those for period of ice effect, Dec. 4 to Mar. 19, and for estimated periods, July 10–16 and July 28 to Aug. 3, which are fair.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14,600	17,100	14,100				66,100	26,200	113,000	59,300	26,000	11,600
2	14,400	17,000	12,400				53,000	27,800	124,000	58,600	23,000	11,600
3	14,400	16,800	12,100			11,000	45,200	28,500	122,000	59,300	21,000	11,500
4	14,300	16,700					52,400	30,100	103,000	67,600	19,400	11,200
5	14,300	16,500		13,400	8,200		56,100	31,500	79,600	69,700	19,000	11,000
6	14,300	16,200					45,600	32,200	70,200	69,700	18,300	10,900
7	14,200	16,200	9,400				39,400	33,000	73,600	71,500	17,600	10,900
8	14,200	16,200					34,400	33,700	82,000	65,200	16,900	10,900
9	14,300	16,000					32,700	35,200	102,000	60,000	16,300	10,900
10	14,200	15,900				11,000	34,100	36,800	138,000	57,000	16,000	10,900
11	14,200	16,100					40,300	37,200	138,000	52,000	15,800	11,300
12	14,000	15,900					40,200	36,100	101,000	48,000	15,700	11,100
13	14,000	15,900					37,400	33,800	68,200	46,000	15,500	10,900
14	14,200	16,000					31,700	36,300	87,900	45,000	15,200	10,900
15	14,200	16,200					29,900	39,100	100,000	44,000	14,900	11,100
16	14,200	15,900	8,400	11,400	9,370	18,000	28,000	40,100	93,100	38,000	15,000	11,200
17	14,200	16,200					27,400	38,200	83,100	33,400	15,100	11,600
18	14,400	16,500					25,400	36,100	80,900	32,200	15,000	12,200
19	14,700	16,700					24,600	32,600	78,800	29,800	14,300	12,800
20	14,600	16,700				33,800	23,900	32,200	82,500	28,900	14,300	13,100
21	15,200	16,700				96,000	23,200	31,900	90,400	28,600	14,900	13,800
22	15,500	17,300				63,300	22,200	30,500	99,300	28,400	14,100	14,100
23	15,800	16,800				53,900	22,300	30,800	101,000	29,300	14,000	14,000
24	15,700	16,700				48,200	22,100	34,600	97,600	30,200	13,400	14,000
25	15,700	16,800			11,300	44,200	22,000	36,600	79,300	29,400	13,100	14,000
26	15,900	16,500	9,100	9,850		44,200	22,300	48,600	74,200	30,100	12,900	14,000
27	16,200	16,300				61,000	22,900	48,400	65,200	30,600	12,600	14,000
28	16,400	16,300				104,000	23,100	54,100	64,300	30,000	12,100	13,500
29	16,600	13,800				153,000	24,200	73,000	60,000	29,000	11,800	13,300
30	16,800	13,900				115,000	25,200	89,600	59,600	29,000	11,700	13,200
31	17,100	-------				53,200	-------	106,000	--------	28,000	11,700	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	17,100	14,000	14,900	916,000
November	17,100	13,800	16,300	970,000
December	----------	----------	9,310	572,000
January	----------	----------	11,500	707,000
February	----------	----------	9,500	528,000
March	153,000	----------	36,300	2,230,000
April	66,100	22,000	33,200	1,980,000
May	106,000	26,200	40,700	2,500,000
June	138,000	59,600	90,400	5,380,000
July	71,500	28,000	43,800	2,690,000
August	26,000	11,700	15,700	965,000
September	14,100	10,900	12,200	726,000
The year	153,000	----------	27,900	20,200,000

Digitized by Google

MISSOURI RIVER AT CHAMBERLAIN, S. DAK.

LOCATION.—Staff gage in sec. 16, T. 104 N., R. 71 W., at Chamberlain. Zero of gage is 1,330.8 feet above mean sea level.
DRAINAGE AREA.—250,000 square miles.
RECORDS AVAILABLE.—August, 1928, to September, 1929; discontinued.
EXTREMES.—Maximum discharge during year, 151,000 second-feet June 4; maximum gage height, 9.26 feet Mar. 30; minimum discharge, 7,680 second-feet Dec. 11 (gage height, −1.2 feet).
REMARKS.—Records fair. Discharge estimated because of ice Jan. 1 to Mar. 16.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15,800	15,600	15,100				77,000	25,100	113,000	65,300	27,700	12,300
2	15,800	16,500	14,700				69,100	24,700	118,000	63,100	27,400	11,900
3	15,800	16,800	13,600			16,000	75,400	25,800	140,000	61,200	26,000	12,300
4	15,600	16,800	10,400				68,000	27,300	146,000	60,100	23,800	11,900
5	15,300	17,400	12,300				61,600	29,200	138,000	59,000	22,600	11,900
6	15,300	17,400	10,800	13,00	8,600		66,800	31,500	117,000	62,300	21,900	11,900
7	15,300	17,400	8,620				66,600	33,000	96,600	68,200	20,600	12,300
8	15,300	17,400	9,160			18,000	57,300	34,600	89,000	68,400	20,000	12,300
9	15,300	17,400	8,490				52,800	36,400	93,000	70,000	19,100	12,700
10	15,000	17,100	7,820				53,800	38,400	100,000	68,400	18,600	12,300
11	15,000	16,800	7,680				56,500	39,200	122,000	62,400	18,100	12,300
12	14,800	16,800	7,820				53,200	39,300	147,000	55,600	18,000	12,300
13	15,300	16,800	9,570				52,400	40,700	131,000	54,000	17,900	12,300
14	15,300	17,100	9,710			35,000	52,200	41,200	97,000	54,000	17,500	11,800
15	15,800	16,200	9,850				50,600	40,300	85,600	51,400	17,300	11,400
16	15,800	16,200	9,710	12,500	9,800		44,800	38,800	100,000	44,400	16,600	11,300
17	15,800	16,800	9,160			52,800	39,600	38,900	106,000	39,900	16,100	11,200
18	15,800	16,500	8,490			39,600	37,900	39,200	98,600	37,900	15,600	11,000
19	14,800	17,100	8,360			31,600	35,500	42,600	96,000	37,900	15,500	11,000
20	14,800	16,800	8,080			27,500	32,400	42,400	88,200	36,700	15,200	11,000
21	14,800	16,800	9,160			46,600	29,000	39,600	97,800	36,100	14,600	11,400
22	14,800	16,800	9,300			61,200	28,200	37,200	94,200	32,400	14,400	11,400
23	14,800	16,800	9,440			84,000	26,800	33,200	103,000	31,900	14,200	12,000
24	14,800	16,600	9,570			82,100	26,800	31,200	105,000	31,600	13,900	12,500
25	14,600	16,200	9,030		11,800	77,400	33,300	30,900	97,200	29,800	13,300	13,100
26	15,000	16,200	8,760	10,300		63,800	32,000	28,400	81,900	31,200	13,400	13,700
27	15,100	15,600	9,160			54,600	27,800	30,400	76,000	32,200	13,500	14,300
28	15,200	15,100	9,300			55,400	32,800	36,600	71,600	32,100	13,500	14,300
29	15,200	15,000	10,800			80,200	29,300	50,300	72,500	31,400	13,300	14,300
30	15,200	15,200	10,900			120,000	27,300	84,000	68,900	31,900	12,300	14,300
31	15,600		10,800			103,000		91,600		30,700	12,300	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	15,800	14,600	15,300	941,000
November	17,400	15,000	16,600	988,000
December	15,100	7,680	9,860	606,000
January			11,900	732,000
February			9,940	552,000
March	120,000		43,900	2,700,000
April	77,000	26,800	46,600	2,770,000
May	91,600	24,700	38,800	2,390,000
June	147,000	68,900	103,000	6,130,000
July	70,000	29,800	47,500	2,920,000
August	27,700	12,300	17,600	1,080,000
September	14,300	11,000	12,300	732,000
The year	147,000		31,100	22,500,000

Digitized by Google

MISSOURI RIVER AT SIOUX CITY, IOWA

LOCATION.—Chain gage in Sioux City, half a mile below Big Sioux River. Zero of gage is 1,078.64 feet above mean sea level.
DRAINAGE AREA.—314,000 square miles.
RECORDS AVAILABLE.—September, 1928, to September, 1929.
EXTREMES.—Maximum discharge during period, 180,000 second-feet June 5 and 6 (gage height, 11.9 feet); minimum (estimated), 6,750 second-feet Dec. 26–28.
REMARKS.—Records good except those for estimated periods, Dec. 19 to Mar. 15 and Apr. 28–30, which are fair. Daily discharge not determined for February.

Daily and monthly discharge, in second-feet, 1928–29

Day	Sept.	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23,000	17,000	16,700	17,400		17,900	152,000	39,200	104,000	71,400	30,900	14,600
2	23,000	17,400	16,700	17,600		18,500	84,800	33,300	150,000	68,900	32,100	14,400
3	22,200	17,400	16,700	17,600	7,200	20,000	62,100	31,700	166,000	67,600	31,500	14,100
4	21,600	18,200	18,300	17,200		18,700	55,400	30,600	171,000	62,800	30,900	14,100
5	20,700	18,200	16,700	14,900		21,900	79,500	30,600	174,000	59,400	29,800	13,600
6	20,600	17,400	16,700	12,000		24,800	64,500	31,700	177,000	61,700	27,600	13,100
7	20,600	17,400	17,100	11,500		26,300	61,000	35,000	169,000	64,000	26,500	12,700
8	19,800	18,200	18,300	11,200	8,800	28,100	66,900	37,000	131,000	65,000	24,400	12,700
9	18,900	17,400	19,100	11,500		27,500	61,000	37,700	103,000	68,600	22,400	12,900
10	19,800	16,600	19,100	10,900		35,500	53,400	41,600	95,700	72,400	22,400	14,100
11	20,600	16,600	19,100	9,650		51,200	62,100	44,200	98,600	68,900	20,600	14,100
12	21,400	17,000	19,100	9,650		68,500	59,800	42,500	118,000	64,000	20,100	13,600
13	23,700	18,200	19,300	9,520	10,300	32,200	56,500	42,500	160,000	61,700	19,300	12,700
14	24,600	17,000	19,600	10,000		52,000	52,500	41,600	161,000	58,300	18,600	12,500
15	22,500	15,900	19,600	10,600		83,500	48,800	41,600	118,000	56,200	18,600	12,300
16	22,100	22,200	19,600	10,900		55,800	51,400	39,900	91,400	60,500	19,000	12,300
17	21,200	22,600	19,800	10,000		43,000	56,500	46,900	81,800	58,300	19,000	12,300
18	21,000	20,800	19,800	9,650	12,500	67,400	51,400	40,800	94,300	52,100	19,000	12,300
19	21,500	22,600	19,300	6,900		85,300	47,000	40,800	102,000	47,500	19,000	12,400
20	21,000	20,800	19,500	7,500		60,200	42,700	39,900	88,600	45,700	19,000	12,400
21	19,900	19,900	18,700	9,500		44,800	37,800	38,400	84,500	43,100	17,500	12,400
22	19,100	18,700	18,800	8,600		36,000	40,100	37,000	84,500	40,600	18,200	12,200
23	41,100	17,500	18,800	7,600	11,500	65,000	37,100	37,000	81,800	40,600	17,500	11,600
24	36,000	17,500	19,000	7,600		98,000	37,800	34,400	77,900	39,000	17,200	11,600
25	27,200	16,700	19,300	7,600		100,000	38,600	33,900	81,800	39,800	16,900	11,600
26	20,000	16,300	19,300	6,750		90,800	45,300	32,800	90,000	38,200	16,300	11,600
27	19,200	16,000	19,200	6,750		80,000	43,500	31,700	99,400	36,000	16,300	12,100
28	17,800	16,000	19,000	6,750		61,400	41,000	35,000	85,600	34,000	16,000	13,600
29	17,400	16,000	18,800	7,000	10,900	55,800	40,000	51,400	70,200	33,400	15,100	15,200
30	17,000	16,000	18,100	7,100		60,200	40,000	70,400	66,400	33,400	14,600	14,600
31	------	16,700	------	7,150		123,000	------	65,500	------	33,400	14,600	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1928				
September	41,100	17,000	22,200	1,320,000
1928–29				
October	22,600	15,900	17,900	1,100,000
November	19,800	16,700	18,600	1,110,000
December	17,600	6,750	10,300	633,000
January	------	------	10,200	627,000
February	------	------	*11,500	639,000
March	123,000	17,900	53,300	3,280,000
April	152,000	37,100	55,700	3,310,000
May	74,000	30,600	39,900	2,450,000
June	177,000	66,400	113,000	6,720,000
July	72,400	33,400	53,100	3,260,000
August	32,100	14,600	21,000	1,290,000
September	15,200	11,600	13,000	774,000
The year	177,000	------	34,800	25,200,000

* Estimated.

Digitized by Google

MISSOURI RIVER AT OMAHA, NEBR.

LOCATION.—Chain gage in sec. 22, T. 75 N., R. 44 W., at Illinois Central Railroad bridge at Omaha. Zero of gage is 962.68 feet above mean sea level.
DRAINAGE AREA.—323,000 square miles.
RECORDS AVAILABLE.—September, 1928, to September, 1929.
EXTREMES.—Maximum discharge during period, 198,000 second-feet June 7 (gage height, 14.28 feet); minimum occurred during winter.
REMARKS.—Records good except those for estimated period, Jan. 1 to Mar. 11, which are fair.

Daily and monthly discharge, in second-feet, 1928–29

Day	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28,000	20,300	19,000	18,800			18,900	130,000	47,400	53,000	68,200	32,200	15,700
2	29,000	19,800	20,400	18,600			18,700	164,000	41,100	107,000	68,000	32,200	15,500
3	27,200	19,600	20,500	18,000	6,400	10,800	19,300	119,000	36,300	139,000	65,200	31,000	15,200
4	26,200	19,300	20,300	16,900			20,800	87,600	34,600	160,000	64,400	30,300	15,500
5	25,000	19,000	20,500	17,500			19,500	81,800	33,500	171,000	60,400	28,700	15,500
6	24,500	18,000	20,300	9,310			23,100	90,300	34,400	186,000	61,400	28,600	15,300
7	24,500	17,800	20,300	10,100			26,000	79,200	34,700	198,000	62,600	27,300	14,500
8	24,000	18,000	20,600	10,300	6,900	11,100	27,500	73,400	35,100	184,000	64,000	28,200	14,800
9	23,400	17,800	21,200	9,880			29,300	74,500	36,500	143,000	63,000	26,200	15,800
10	22,400	17,300	21,000	9,840			31,500	71,400	37,900	112,000	66,000	25,200	15,600
11	22,400	16,600	22,100	7,650			39,700	71,000	44,200	99,800	72,300	24,300	15,300
12	26,600	26,200	22,200	7,880			55,500	66,800	42,100	99,100	72,500	24,200	15,300
13	25,600	21,400	20,600	8,390	8,300	11,400	73,600	62,400	42,600	115,000	78,200	23,000	15,100
14	24,700	18,600	21,300	9,310			38,200	62,000	43,700	148,000	79,700	22,200	15,000
15	26,600	18,300	21,500	10,200			57,700	57,700	43,700	148,000	63,200	21,500	15,000
16	28,300	19,000	21,400	14,700			88,600	56,600	44,800	119,000	58,900	20,700	14,000
17	25,300	22,100	21,400	11,900			64,400	56,000	42,100	99,300	61,400	20,400	13,400
18	24,200	25,300	21,500	11,500	10,200	11,800	46,600	60,000	47,400	93,300	57,200	20,500	13,400
19	23,700	23,700	21,100	10,500			87,800	54,800	45,400	101,000	49,600	20,100	14,100
20	22,900	22,900	20,000	9,360			95,300	50,100	42,900	99,100	44,800	19,700	13,900
21	22,700	21,500	20,500	6,790			64,400	45,100	41,000	87,600	43,400	18,800	13,800
22	22,100	21,000	20,400	6,800			48,300	43,400	38,200	82,800	42,100	18,400	13,700
23	21,900	20,000	20,100	14,000	12,000		43,300	42,000	36,700	80,600	42,200	18,200	13,400
24	35,000	19,400	20,000	10,200			65,800	40,300	36,800	78,000	42,400	17,300	12,900
25	37,500	19,000	20,000	8,130		13,000	101,000	36,800	36,100	78,000	41,400	17,300	12,600
26	30,800	18,700	19,200	8,220			108,000	41,400	34,800	83,500	38,200	16,900	12,400
27	25,600	17,700	19,000	8,260			104,000	41,500	34,200	96,300	35,600	16,700	11,900
28	22,900	17,700	19,000	6,870	11,500		91,800	39,900	32,300	98,000	35,000	16,500	12,500
29	22,100	17,900	18,800	6,740			76,300	47,200	33,300	87,800	35,100	16,300	13,100
30	21,100	17,800	18,800	6,960			64,400	56,400	39,900	69,700	34,600	16,000	14,300
31		17,700		7,360			84,700		55,500		33,800	15,800	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1928				
September	37,500	21,100	25,500	1,520,000
1928–29				
October	26,200	16,600	19,700	1,210,000
November	22,200	18,800	20,400	1,210,000
December	18,800	6,740	10,700	658,000
January			9,290	571,000
February			11,800	655,000
March	108,000	18,700	55,900	3,440,000
April	164,000	36,800	66,800	3,970,000
May	55,500	32,300	39,600	2,430,000
June	198,000	69,700	114,000	6,780,000
July	79,700	33,800	55,000	3,380,000
August	32,200	15,800	22,400	1,380,000
September	15,800	11,900	14,300	851,000
The year	198,000		36,700	26,500,000

Digitized by Google

MISSOURI RIVER AT NEBRASKA CITY, NEBR.

LOCATION.—Chain gage in sec. 10, T. 8 N., R. 14 E., at Chicago, Burlington & Quincy Railroad bridge at Nebraska City. Zero of gage is 905.32 feet above mean sea level.

RECORDS AVAILABLE.—August to September, 1929.

EXTREMES.—Maximum discharge during period, 27,600 second-feet Aug. 11 (gage height, 7.35 feet); minimum, 16,200 second-feet Sept. 3 (gage height, 5.72 feet).

REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1929

Day	Aug.	Sept.	Day	Aug.	Sept.
1		17,600	16	23,400	19,500
2		16,900	17	22,100	18,800
3		16,200	18	22,100	18,800
4		16,900	19	20,800	18,800
5		18,200	20	20,800	19,500
6		18,200	21	20,800	19,500
7		16,900	22	20,200	19,500
8		17,600	23	19,500	19,500
9		19,500	24	20,200	18,800
10		20,200	25	20,200	18,800
11	27,600	20,800	26	19,500	18,200
12	26,900	20,800	27	19,500	18,200
13	26,900	20,800	28	18,800	18,200
14	24,800	20,800	29	17,600	18,800
15	22,400	19,500	30	17,600	19,500
			31	18,200	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
August 11-31	27,600	17,600	21,500	894,000
September	20,800	16,200	18,800	1,120,000
The period				2,010,000

Digitized by Google

MISSOURI RIVER AT ST. JOSEPH, MO.

LOCATION.—Chain gage in sec. 17, T. 57 N., R. 35 W., at St. Joseph & Grand Island Railway bridge at St. Joseph, Buchanan County. Zero of gage is 794.93 feet above mean sea level.

DRAINAGE AREA.—427,000 square miles.

RECORDS AVAILABLE.—August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 196,000 second-feet June 4 (gage height, 10.1 feet); minimum discharge, 9,600 second-feet Dec. 23 and Jan. 8–10; minimum gage height, −1.1 feet Dec. 23.

1928–29: Maximum and minimum discharge and gage height, same as given above.

Maximum stage known, 21.7 feet Apr. 29, 1881.

REMARKS.—Records good except those for period of ice effect, Jan. 4 to Mar. 8, which are poor. Gage-height record furnished by United States Weather Bureau.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28,600	25,200	30,400	17,500	20,000	28,600	83,000	75,000	68,600	100,000	58,600	20,400
2	27,700	32,200	30,400	14,900	20,000	27,700	106,000	81,400	121,000	92,100	45,600	20,400
3	26,800	40,100	29,500	11,600	19,300	27,700	134,000	68,600	151,000	86,400	41,200	19,500
4	26,000	33,000	26,000	10,800	19,300	28,600	129,000	58,600	196,000	81,000	39,000	19,100
5	24,400	34,000	26,000	10,000	18,700	30,400	95,600	53,800	190,000	81,000	37,000	18,300
6	21,400	31,300	26,000	10,000	18,700	33,100	78,200	51,400	175,000	134,000	37,000	18,300
7	23,600	29,500	22,100	10,000	18,100	37,000	90,200	47,800	184,000	170,000	35,000	18,300
8	21,400	28,600	15,400	9,600	18,100	40,100	90,200	45,600	187,000	134,000	35,700	18,300
9	20,700	29,500	12,000	9,600	18,100	45,600	76,600	44,500	190,000	92,000	34,100	19,500
10	21,400	31,300	12,400	9,600	18,100	47,800	75,000	44,500	172,000	78,200	34,100	23,500
11	21,400	31,300	14,400	10,000	18,100	67,000	86,600	47,800	144,000	81,400	32,500	21,900
12	21,400	32,200	16,400	10,000	18,100	57,400	79,800	76,600	126,000	102,000	30,900	21,900
13	21,400	28,600	16,900	10,000	17,500	78,200	73,400	70,200	116,000	83,000	29,500	21,400
14	35,000	31,300	22,100	10,000	16,900	114,000	71,800	62,800	118,000	75,000	28,800	21,900
15	35,000	30,400	26,000	10,000	16,400	154,000	78,200	61,400	139,000	83,000	28,100	21,400
16	32,200	31,300	26,800	10,800	16,400	88,400	71,800	56,200	156,000	108,000	26,000	20,900
17	28,600	42,300	26,000	11,600	15,900	114,000	62,800	50,200	147,000	92,000	24,100	20,400
18	27,700	52,600	28,600	11,600	15,400	90,200	60,000	52,600	118,000	81,400	24,100	19,500
19	30,400	46,700	26,800	12,400	14,900	75,000	64,200	49,000	114,000	75,000	24,100	19,500
20	39,000	39,000	23,600	12,400	14,900	75,000	90,200	51,400	111,000	67,000	22,900	19,900
21	35,000	34,000	20,700	13,400	15,900	102,000	81,400	51,400	136,000	60,000	23,500	19,900
22	34,000	33,100	14,400	13,900	18,700	84,800	92,000	46,700	126,000	53,800	23,500	21,400
23	28,600	30,100	9,600	14,400	22,100	68,600	71,800	47,800	184,000	51,400	24,100	20,900
24	28,600	30,400	10,400	16,400	25,200	61,400	64,200	44,500	150,000	49,000	24,100	20,900
25	24,400	29,500	12,400	16,900	29,500	73,400	64,200	47,800	116,000	49,000	24,100	20,400
26	26,000	28,600	12,400	17,500	33,100	95,600	67,000	50,200	100,000	50,200	22,900	20,400
27	25,200	28,600	26,000	18,700	36,000	112,000	68,600	45,600	98,400	47,800	22,400	19,900
28	26,000	28,600	16,400	18,700	32,200	105,000	70,200	43,400	107,000	46,700	21,400	19,500
29	26,000	26,800	16,900	20,000	-------	99,600	75,000	42,300	116,000	41,200	20,900	19,100
30	25,200	31,300	18,700	20,000	-------	88,400	64,200	45,600	116,000	40,100	19,900	19,100
31	23,600	-------	18,700	20,000	-------	84,800	-------	46,700	-------	71,800	20,400	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	39,000	20,700	27,000	1,660,000
November	52,600	25,200	32,900	1,960,000
December	30,400	9,600	20,500	1,260,000
January	20,000	9,600	13,300	818,000
February	36,000	14,900	20,200	1,120,000
March	154,000	27,700	72,100	4,430,000
April	134,000	60,000	80,500	4,790,000
May	81,400	42,300	53,600	3,300,000
June	196,000	68,600	139,000	8,270,000
July	170,000	40,100	79,300	4,880,000
August	58,600	19,900	29,500	1,810,000
September	23,500	18,300	20,200	1,200,000
The year	196,000	9,600	49,000	35,500,000

Digitized by Google

MISSOURI RIVER AT LEAVENWORTH, KANS.

LOCATION.—Chain gage in sec. 36, T. 8. S, R. 22 E., at Chicago Great Western Railroad bridge in Leavenworth. Zero of gage is 713.53 feet above mean sea level.

DRAINAGE AREA.—428,000 square miles.

RECORDS AVAILABLE.—April, 1922, to September, 1929.

EXTREMES.—Maximum discharge during year, 212,000 second-feet June 4; maximum gage height, 48.0 feet June 23; minimum discharge, 10,600 second-feet Jan. 6–12.

1922–1929: Maximum discharge, 241,000 second-feet July 7 and 8, 1923; maximum gage height, 49.3 feet June 28, 1924, and May 17, 18, June 29, and 30, 1927; minimum discharge, 3,450 second-feet Dec. 22, 1924.

Maximum stage known, 53.0 feet Apr. 29 and 30, 1881.

ACCURACY.—Records fair except those for periods of ice effect, Jan. 3 to Mar. 4, which are poor.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	27,500	28,300	38,500	20,000	21,800	37,500	80,200	66,400	88,600	104,000	65,100	21,700
2	23,100	33,100	35,500	12,200	21,800	34,700	104,000	65,100	146,000	98,000	49,900	21,700
3	21,200	43,500	35,500	11,800	20,600	32,300	134,000	63,800	172,000	90,400	42,500	21,700
4	25,900	43,500	33,100	11,000	20,000	30,700	134,000	63,800	211,000	88,600	43,500	20,500
5	25,200	43,500	31,500	11,000	19,400	29,900	98,000	65,100	211,000	83,400	39,500	20,500
6	24,500	39,500	30,700	10,600	18,800	30,700	80,200	62,500	197,000	132,000	38,500	20,500
7	24,500	36,500	27,500	10,600	18,200	34,700	88,600	47,700	197,000	164,000	38,500	20,500
8	23,800	35,500	19,400	10,600	18,200	66,400	98,000	44,500	208,000	144,000	38,500	20,500
9	23,800	34,700	14,700	10,600	18,200	52,100	80,200	43,500	208,000	92,200	37,500	20,500
10	23,100	36,500	13,400	10,600	18,200	52,100	80,200	44,500	194,000	81,800	37,500	22,300
11	23,100	36,500	14,200	10,600	18,200	60,100	85,000	45,500	159,000	80,200	36,500	25,000
12	23,100	36,500	17,200	10,600	18,200	55,400	81,800	67,700	137,000	104,000	34,700	24,300
13	23,800	35,500	19,400	11,000	18,800	65,100	80,200	69,000	122,000	83,400	33,800	23,600
14	26,700	35,500	24,500	11,000	18,200	94,000	73,800	62,500	122,000	77,000	32,900	22,900
15	36,500	37,500	25,200	11,000	18,200	149,000	80,200	62,500	137,000	78,600	31,300	22,900
16	34,700	38,500	27,500	11,400	17,700	94,000	78,600	56,500	154,000	108,000	30,500	22,300
17	30,700	55,400	28,300	11,800	17,200	113,000	69,000	53,200	144,000	88,600	28,900	21,100
18	28,300	57,700	29,900	12,200	16,700	100,000	67,700	54,300	117,000	81,800	28,100	21,100
19	23,800	58,900	29,900	12,600	16,200	83,400	72,200	52,100	108,000	75,400	26,500	20,500
20	37,500	51,000	25,900	13,400	15,700	73,800	98,000	52,100	108,000	70,600	25,700	20,500
21	40,500	55,400	23,100	14,200	15,700	127,000	100,000	53,200	127,000	67,700	25,700	21,100
22	35,500	43,500	17,700	15,700	16,700	90,400	111,000	51,000	141,000	61,300	25,700	21,700
23	40,500	41,500	13,000	17,200	18,200	73,800	90,400	48,800	177,000	56,500	24,300	22,300
24	39,500	40,500	12,200	18,200	23,800	65,000	90,400	48,800	151,000	52,100	24,300	21,700
25	37,500	38,500	11,800	19,400	35,500	69,000	81,800	49,900	117,000	52,100	24,300	21,100
26	27,500	36,500	12,600	20,600	41,500	88,600	75,400	53,200	108,000	52,100	24,300	20,500
27	27,500	35,500	17,700	21,200	43,500	111,000	65,100	52,100	102,000	49,900	22,900	20,500
28	28,300	35,500	23,800	21,800	42,500	108,000	67,700	48,800	108,000	47,700	22,900	20,000
29	27,500	35,500	17,700	21,800	-------	98,000	72,200	45,500	120,000	43,500	22,900	19,500
30	26,700	36,500	18,800	21,800	-------	90,400	65,100	45,500	117,000	40,500	22,300	19,500
31	26,700	-------	23,800	22,400	-------	80,200	-------	52,100	-------	61,300	21,700	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	40,500	21,200	28,700	1,760,000
November	58,900	28,300	40,600	2,420,000
December	38,500	12,200	23,000	1,410,000
January	22,400	10,600	14,500	892,000
February	43,500	15,700	21,700	1,210,000
March	149,000	29,900	73,900	4,540,000
April	134,000	65,100	86,100	5,120,000
May	69,000	43,500	54,600	3,360,000
June	211,000	88,600	147,000	8,750,000
July	164,000	40,500	81,000	4,980,000
August	65,100	21,700	32,300	1,990,000
September	25,000	19,500	21,400	1,270,000
The year	211,000	10,600	52,100	37,700,000

Digitized by Google

MISSOURI RIVER AT KANSAS CITY, MO.

LOCATION.—Chain gage in sec. 31, T. 50 N., R. 33 W., at Chicago, Burlington & Quincy Railroad bridge at Kansas City, 1 mile below Kansas River. Zero of gage is 716.93 feet above mean sea level.

DRAINAGE AREA.—492,000 square miles.

RECORDS AVAILABLE.—August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 254,000 second-feet June 5 (gage height, 23.4 feet); minimum discharge, 16,200 second-feet Jan. 7–12; minimum gage height, 4.1 feet Sept. 30.

1928–29: Maximum and minimum discharge and gage height, same as given above.

Maximum stage known, 38.0 feet June 20, 1844.

REMARKS.—Records good except those for period of ice effect, Jan. 4 to Mar. 3, which are poor. Gage-height record furnished by United States Weather Bureau.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30,200	31,500	45,500	26,000	26,000	56,800	99,700	82,600	114,000	120,000	67,600	22,900
2	29,000	37,100	47,600	26,000	25,400	51,200	106,000	95,600	185,000	105,000	60,400	22,400
3	27,800	46,200	46,200	19,600	24,900	48,300	127,000	88,600	240,000	95,600	51,200	22,400
4	27,200	53,600	44,800	20,400	23,900	47,600	136,000	77,600	248,000	89,600	48,300	24,400
5	27,200	55,200	42,700	17,400	23,900	46,200	112,000	72,100	254,000	84,600	45,500	23,900
6	26,600	52,800	39,200	16,500	23,900	47,600	93,600	67,600	230,000	88,600	43,400	23,400
7	26,000	52,000	37,100	16,200	23,900	64,900	90,600	64,900	213,000	165,000	42,700	23,900
8	25,400	49,700	34,300	16,200	22,900	89,600	112,000	62,200	215,000	174,000	41,300	22,900
9	24,900	46,200	27,200	16,200	22,900	82,600	94,600	60,400	222,000	126,000	40,600	22,900
10	24,900	44,100	23,400	16,200	22,900	77,600	90,600	59,500	217,000	110,000	39,200	22,900
11	24,400	44,800	22,000	16,200	22,900	73,000	94,600	59,500	186,000	104,000	39,200	26,000
12	24,400	44,100	23,900	16,200	22,900	79,600	98,600	89,600	160,000	111,000	37,100	26,000
13	23,900	43,400	26,600	16,500	23,400	80,600	92,600	116,000	147,000	107,000	34,300	24,900
14	24,400	42,000	31,500	16,500	23,900	103,000	87,600	115,000	152,000	93,600	35,700	24,900
15	36,400	42,000	32,900	17,100	24,400	147,000	87,600	111,000	160,000	96,600	35,700	24,400
16	36,400	44,800	35,700	17,700	24,900	127,000	88,600	99,700	181,000	115,000	33,600	23,900
17	32,900	105,000	38,500	18,300	26,000	125,000	83,600	89,600	183,000	116,000	31,500	23,400
18	29,600	108,000	38,500	19,300	26,600	126,000	77,600	83,600	152,000	107,000	29,600	22,900
19	35,000	122,000	37,800	20,400	27,800	108,000	74,800	83,600	140,000	94,600	29,000	22,000
20	40,600	105,000	33,600	22,000	29,000	93,600	103,000	78,600	136,000	86,600	28,400	22,000
21	46,900	89,600	30,800	22,900	30,200	111,000	183,000	77,600	149,000	76,600	27,800	22,000
22	46,900	75,700	28,400	23,900	31,500	107,000	212,000	74,800	161,000	67,600	27,200	22,000
23	42,000	65,800	24,400	24,400	33,600	94,600	188,000	69,400	219,000	63,100	27,200	22,000
24	39,900	59,500	20,800	24,900	36,400	84,600	140,000	67,600	224,000	59,500	27,200	22,400
25	37,100	50,400	20,000	25,400	44,800	81,600	119,000	65,800	179,000	56,000	26,600	21,600
26	35,700	46,900	19,600	26,000	52,000	98,600	113,000	67,600	147,000	56,000	26,000	20,800
27	33,600	44,100	22,000	26,000	61,300	114,000	99,700	67,600	130,000	55,200	26,600	20,400
28	33,600	44,800	30,800	26,000	59,500	112,000	98,600	63,100	127,000	52,800	26,000	20,400
29	33,600	44,100	26,600	26,600	-------	107,000	94,600	60,400	133,000	49,700	24,900	20,400
30	32,900	44,100	25,400	26,600	-------	99,700	91,600	57,700	130,000	46,900	23,400	20,000
31	31,500	-------	26,000	26,000	-------	96,600	-------	67,600	-------	46,900	22,900	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	46,900	23,900	32,000	1,970,000
November	122,000	31,500	57,800	3,440,000
December	47,600	19,600	31,700	1,950,000
January	26,600	16,200	21,000	1,290,000
February	61,300	22,900	30,100	1,670,000
March	147,000	46,200	89,700	5,520,000
April	212,000	74,800	110,000	6,550,000
May	116,000	57,700	77,300	4,750,000
June	254,000	114,000	178,000	10,600,000
July	174,000	46,900	91,000	5,600,000
August	67,600	22,900	35,500	2,180,000
September	26,000	20,000	22,800	1,360,000
The year	254,000	16,200	64,700	46,900,000

Digitized by Google

MISSOURI RIVER AT WAVERLY, MO.

LOCATION.—Chain gage in sec. 14, T. 51 N., R. 24 W., at bridge on State highway No. 24 at Waverly. Zero of gage is 641.54 feet above mean sea level.
DRAINAGE AREA.—494,000 square miles.
RECORDS AVAILABLE.—March to September, 1929.
EXTREMES.—Maximum discharge during period, 263,000 second-feet June 5 (gage height, 24.9 feet); minimum, 21,300 second-feet Sept. 30 (gage height, 8.5 feet).

Maximum stage known, 25.9 feet July 22, 1915.

REMARKS.—Records fair. Discharge estimated Sept. 6–10. Gage-height record furnished by United States Weather Bureau.

Daily and monthly discharge, in second-feet, 1929

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1	97,600	127,000	100,000	77,000	132,000	58,600	24,700
2	92,000	127,000	90,600	153,000	111,000	70,400	24,200
3	79,200	135,000	102,000	208,000	100,000	59,500	23,700
4	70,400	153,000	92,000	245,000	92,000	50,800	23,700
5	70,400	143,000	77,000	263,000	85,200	48,400	23,700
6	68,400	116,000	72,600	254,000	80,400	44,400	25,200
7	68,400	105,000	66,400	242,000	137,000	43,600	24,800
8	100,000	124,000	62,400	228,000	180,000	42,800	24,400
9	106,000	124,000	59,500	233,000	151,000	43,600	24,000
10	93,400	116,000	55,900	233,000	119,000	39,900	23,600
11	79,200	122,000	54,100	219,000	108,000	39,200	23,300
12	94,800	125,000	79,200	177,000	106,000	39,200	26,200
13	99,000	119,000	125,000	157,000	117,000	36,400	26,700
14	108,000	109,000	122,000	151,000	99,000	35,000	26,200
15	155,000	105,000	114,000	155,000	92,000	34,400	25,700
16	175,000	109,000	105,000	170,000	102,000	34,400	24,700
17	147,000	105,000	92,000	177,000	125,000	32,600	24,200
18	127,000	96,200	90,600	163,000	116,000	32,000	23,700
19	130,000	92,000	81,600	145,000	105,000	30,800	22,100
20	114,000	108,000	77,000	139,000	94,800	30,200	22,500
21	106,000	172,000	71,500	141,000	85,200	29,700	22,500
22	127,000	219,000	71,500	170,000	75,900	28,200	22,500
23	105,000	236,000	66,400	211,000	68,400	28,200	22,500
24	92,000	195,000	63,400	225,000	64,400	27,700	22,900
25	79,200	147,000	62,400	214,000	61,400	27,700	22,500
26	105,000	125,000	59,500	168,000	57,700	27,700	22,500
27	125,000	117,000	62,400	137,000	58,600	27,700	22,100
28	135,000	103,000	61,400	130,000	56,800	27,200	22,100
29	132,000	105,000	57,700	130,000	54,100	27,200	21,700
30	122,000	105,000	55,900	137,000	50,800	26,200	21,300
31	119,000		60,400		46,800	25,700	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March	175,000	68,400	107,000	6,580,000
April	236,000	92,000	129,000	7,680,000
May	125,000	54,100	77,800	4,780,000
June	263,000	77,000	182,000	10,800,000
July	180,000	46,800	94,600	5,820,000
August	70,400	25,700	37,100	2,280,000
September	26,700	21,300	23,700	1,410,000
The period				39,400,000

Digitized by Google

MISSOURI RIVER AT BOONVILLE, MO.

LOCATION.—Chain gage in sec. 35, T. 49 N., R. 17 W., at Missouri-Kansas-Texas Railroad bridge at Boonville. Zero of gage is 565.87 feet above mean sea level. Prior to October 1, 1928, a chain gage on highway bridge one-fourth mile downstream was used; elevation of zero, 562.71 feet above mean sea level.

DRAINAGE AREA.—508,000 square miles.

RECORDS AVAILABLE.—October, 1925, to September, 1929.

EXTREMES.—Maximum discharge during year, 344,000 second-feet June 7 (gage height, 23.7 feet); minimum discharge, 19,400 second-feet Jan. 7 and 8; minimum gage height, 5.0 feet Sept. 8–10.

1925–1929: Maximum discharge, 381,000 second-feet Apr. 23, 1927 (gage height, 23.9 feet present datum); minimum discharge, 12,400 second-feet Dec. 15–18, 1927; minimum gage height, 4.8 feet present datum, Dec. 21, 1927. Maximum stage known, 32.7 feet present datum, June 21, 1844.

REMARKS.—Records good except those for periods of ice effect, Jan. 12–16 and Jan. 23 to Feb. 10, which are poor. Gage-height record furnished by United States Weather Bureau.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	40,200	36,600	55,400	28,700	26,800	114,000	168,000	137,000	90,000	131,000	52,200	26,200
2	34,400	34,400	56,800	27,400	26,800	104,000	188,000	136,000	139,000	125,000	60,100	25,600
3	32,500	51,200	62,400	27,400	26,200	100,000	186,000	131,000	210,000	113,000	74,400	25,000
4	30,700	74,400	61,000	24,400	26,200	103,000	200,000	121,000	260,000	103,000	62,400	24,400
5	30,700	87,200	55,400	21,300	26,200	103,000	190,000	109,000	307,000	96,000	54,900	25,600
6	29,800	92,000	53,100	21,300	26,200	98,800	164,000	96,000	332,000	91,200	52,100	26,200
7	28,900	97,400	48,600	19,400	25,600	94,800	128,000	88,800	344,000	93,600	49,500	25,600
8	28,000	99,200	45,000	19,400	25,000	103,000	125,000	82,800	341,000	150,000	47,700	23,900
9	27,200	93,800	41,500	19,900	24,400	116,000	152,000	75,600	321,000	186,000	47,700	23,900
10	27,200	74,400	36,700	20,400	23,400	127,000	166,000	69,600	293,000	166,000	47,700	23,900
11	26,500	58,200	32,100	24,400	23,400	123,000	164,000	66,000	262,000	144,000	45,900	24,400
12	25,800	52,600	29,400	25,000	22,800	121,000	164,000	87,600	230,000	136,000	43,200	29,400
13	25,800	51,200	28,000	29,400	22,800	127,000	156,000	139,000	200,000	133,000	43,200	30,700
14	25,100	48,400	33,500	30,700	22,300	124,000	133,000	190,000	177,000	136,000	40,700	30,700
15	25,100	48,400	46,800	26,800	23,400	150,000	120,000	186,000	166,000	120,000	38,300	28,700
16	25,800	54,000	54,900	24,400	23,400	213,000	113,000	160,000	158,000	110,000	37,500	27,400
17	40,200	123,000	70,800	22,800	25,000	218,000	118,000	133,000	162,000	116,000	37,500	26,200
18	41,400	254,000	88,800	22,300	28,000	200,000	116,000	124,000	170,000	133,000	36,700	26,200
19	51,200	316,000	88,800	24,400	30,700	200,000	104,000	127,000	162,000	124,000	34,300	25,600
20	58,200	338,000	73,200	28,000	35,900	158,000	102,000	141,000	150,000	113,000	32,800	25,000
21	65,200	330,000	60,100	28,700	33,500	131,000	146,000	124,000	152,000	102,000	32,100	23,900
22	77,600	296,000	50,400	28,000	35,900	128,000	210,000	114,000	158,000	93,600	30,700	26,800
23	68,000	243,000	41,500	27,400	37,500	137,000	251,000	88,800	175,000	86,400	30,700	28,000
24	65,200	198,000	34,300	28,700	38,300	121,000	296,000	80,400	208,000	79,200	29,400	26,200
25	62,400	160,000	28,700	29,400	41,500	110,000	318,000	73,200	228,000	72,000	29,400	25,600
26	52,600	124,000	26,200	29,400	63,600	100,000	296,000	70,800	225,000	66,000	28,700	25,000
27	42,800	92,000	25,000	29,400	79,200	114,000	251,000	70,800	177,000	62,400	30,700	23,900
28	36,600	77,600	25,000	28,000	134,000	134,000	205,000	73,200	139,000	61,200	29,400	23,900
29	39,000	68,000	26,200	28,000	.....	143,000	170,000	70,800	128,000	60,100	28,700	23,900
30	47,000	61,000	32,800	27,400	.....	137,000	148,000	67,200	128,000	57,900	27,400	23,400
31	42,800	.....	31,400	27,400	.....	131,000	.....	79,200	.....	54,900	26,800	.....

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	77,600	25,100	40,400	2,480,000
November	338,000	34,400	124,000	7,380,000
December	88,800	25,000	46,600	2,870,000
January	30,700	19,400	25,800	1,590,000
February	134,000	22,300	34,900	1,940,000
March	218,000	94,800	132,000	8,120,000
April	318,000	104,000	175,000	10,400,000
May	190,000	66,000	107,000	6,580,000
June	344,000	90,000	206,000	12,300,000
July	186,000	54,900	107,000	6,580,000
August	74,400	26,800	40,700	2,500,000
September	30,700	23,400	25,800	1,540,000
The year	344,000	19,400	88,800	64,300,000

Digitized by Google

MISSOURI RIVER AT ISBELL, MO.

LOCATION.—Staff gage in SW. ¼ sec. 34, T. 45 N., R. 9 W., at Isbell. Zero of gage is 510.0 feet above mean sea level.
DRAINAGE AREA.—524,000 square miles.
RECORDS AVAILABLE.—December, 1928, to September, 1929.
EXTREMES.—Maximum discharge during period, 399,000 second-feet June 8 (gage height, 21.1 feet); minimum discharge, 24,100 second-feet Sept. 30; minimum gage height, 2.6 feet Sept. 11.
REMARKS.—Records fair except those for period of ice effect, Jan. 3 to Feb. 10, which are poor. Discharge estimated Feb. 18–21 and Aug. 15–26.

Daily and monthly discharge, in second-feet, 1928–29

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	117,000	40,000	32,600	149,000	162,000	203,000	99,900	145,000	52,300	27,200
2	107,000	36,500	32,600	136,000	189,000	224,000	154,000	136,000	49,200	27,200
3	99,900	33,800	32,000	128,000	189,000	243,000	262,000	123,000	62,200	26,500
4	91,400	31,200	31,300	128,000	194,000	224,000	321,000	107,000	69,800	25,900
5	75,400	29,900	30,600	123,000	203,000	218,000	355,000	96,500	60,500	27,200
6	63,300	31,200	30,000	119,000	194,000	189,000	376,000	86,300	54,200	27,900
7	56,700	32,500	30,000	113,000	162,000	159,000	396,000	82,900	52,200	28,600
8	51,200	33,800	28,700	102,000	167,000	147,000	399,000	105,000	50,300	27,200
9	47,400	37,900	28,700	113,000	180,000	147,000	379,000	183,000	49,400	27,200
10	44,200	42,100	28,000	138,000	247,000	143,000	345,000	192,000	48,500	25,900
11	39,600	46,700	27,400	134,000	247,000	136,000	304,000	159,000	51,200	25,300
12	36,100	52,600	26,800	127,000	238,000	159,000	272,000	143,000	49,400	27,200
13	34,700	59,200	26,800	136,000	235,000	221,000	281,000	136,000	47,600	30,800
14	34,000	60,300	26,200	132,000	219,000	308,000	227,000	143,000	44,900	32,400
15	38,900	55,900	26,200	152,000	197,000	311,000	206,000	143,000	38,900	30,800
16	51,200	53,700	26,200	256,000	164,000	288,000	197,000	126,000	37,300	29,300
17	67,200	50,800	25,600	265,000	147,000	246,000	189,000	122,000	36,500	28,600
18	98,200	48,300	26,200	230,000	149,000	288,000	200,000	137,000	36,000	27,900
19	117,000	46,700	28,700	218,000	136,000	338,000	200,000	137,000	34,400	27,200
20	113,000	45,100	31,300	192,000	123,000	314,000	175,000	128,000	32,600	25,900
21	99,900	43,500	35,400	157,000	154,000	281,000	167,000	108,000	31,000	25,900
22	86,300	42,800	35,400	132,000	243,000	246,000	178,000	98,000	31,000	25,900
23	72,400	41,400	35,400	140,000	294,000	224,000	206,000	87,900	30,300	25,900
24	63,300	38,200	34,700	136,000	328,000	203,000	243,000	80,400	29,800	29,300
25	53,400	37,500	36,100	117,000	352,000	194,000	281,000	74,800	29,400	27,900
26	44,200	36,800	52,300	127,000	366,000	183,000	294,000	67,200	28,900	26,500
27	37,500	36,100	78,400	125,000	332,000	175,000	259,000	63,900	29,300	26,500
28	34,700	35,400	99,900	143,000	284,000	157,000	212,000	61,700	30,800	25,900
29	33,300	34,700	.....	162,000	239,000	138,000	183,000	61,700	27,900	24,700
30	34,700	34,000	.....	154,000	224,000	107,000	157,000	59,500	27,200	24,100
31	38,200	33,300	.....	140,000	.....	84,600	.....	54,500	27,200	.....

Month	Maximum	Minimum	Mean	Run-off in acre-feet
December	117,000	33,300	63,900	3,930,000
January	60,300	29,900	41,400	2,550,000
February	99,900	25,600	35,100	1,950,000
March	265,000	102,000	149,000	9,160,000
April	366,000	123,000	219,000	13,000,000
May	338,000	84,600	210,000	12,900,000
June	399,000	99,900	251,000	14,900,000
July	192,000	54,500	111,000	6,820,000
August	69,800	27,200	41,300	2,540,000
September	32,400	24,100	27,300	1,620,000
The period				69,370,000

Digitized by Google

MISSOURI RIVER AT HERMANN, MO.

LOCATION.—Staff gage in SW. ¼ sec. 25, T. 46 N., R. 5 W., at Hermann. Zero of gage is 481.72 feet above mean sea level.

DRAINAGE AREA.—528,000 square miles.

RECORDS AVAILABLE.—August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 407,000 second-feet June 8 (gage height, 24.6 feet); minimum, 25,500 second-feet Sept. 30 (gage height, 2.6 feet).

1928–29: Maximum and minimum discharge, same as given above. Maximum stage known, 35.7 feet in June, 1844.

REMARKS.—Records good except those for period of ice effect, Jan. 3 to Feb. 11, which are poor. Discharge estimated Aug. 6–9. Gage-height record furnished by United States Weather Bureau.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	46,100	46,100	119,000	44,300	36,100	156,000	147,000	197,000	114,000	147,000	51,500	29,100
2	43,400	43,400	110,000	41,700	34,600	143,000	197,000	197,000	153,000	141,000	50,600	28,700
3	38,500	36,900	100,000	39,300	34,600	134,000	204,000	254,000	252,000	126,000	59,000	28,300
4	34,600	43,400	93,500	34,600	33,800	130,000	207,000	235,000	330,000	107,000	70,000	27,900
5	33,800	71,500	81,400	32,400	33,100	128,000	222,000	222,000	368,000	95,500	64,000	27,500
6	33,800	83,000	69,700	32,400	32,400	121,000	212,000	182,000	380,000	86,600	56,000	28,700
7	33,100	87,800	60,000	33,800	31,700	110,000	182,000	194,000	398,000	81,800	54,000	29,100
8	31,700	89,000	54,000	36,100	31,000	107,000	149,000	182,000	407,000	85,400	52,000	29,500
9	31,000	90,300	50,000	38,500	30,400	114,000	164,000	184,000	398,000	156,000	51,000	28,700
10	30,400	85,400	46,400	40,900	29,700	135,000	252,000	184,000	356,000	197,000	49,800	27,900
11	29,700	72,600	41,900	45,200	29,000	138,000	282,000	175,000	318,000	169,000	49,800	27,500
12	29,000	60,000	38,300	52,400	29,000	131,000	274,000	164,000	281,000	145,000	53,300	27,500
13	28,400	53,300	35,700	57,000	28,400	138,000	271,000	220,000	304,000	137,000	48,200	29,500
14	27,800	50,600	34,100	64,000	27,800	140,000	252,000	316,000	251,000	135,000	47,400	32,000
15	27,200	48,800	39,300	61,000	27,200	134,000	217,000	335,000	212,000	145,000	44,400	32,500
16	26,600	48,800	47,400	56,000	27,200	268,000	182,000	318,000	192,000	135,000	41,600	31,000
17	29,000	74,800	61,000	54,200	26,600	282,000	160,000	287,000	187,000	125,000	39,600	28,300
18	36,100	175,000	92,000	52,400	26,600	252,000	160,000	253,000	192,000	126,000	38,400	27,900
19	41,700	274,000	116,000	48,800	29,000	230,000	151,000	395,000	207,000	147,000	37,800	27,200
20	45,200	305,000	120,000	47,000	33,800	214,000	135,000	353,000	192,000	137,000	36,000	27,200
21	53,300	308,000	111,000	45,200	38,500	178,000	151,000	304,000	171,000	119,000	34,200	26,400
22	58,000	305,000	95,000	44,300	39,300	147,000	224,000	267,000	169,000	107,000	33,600	26,100
23	66,000	288,000	81,600	43,400	39,300	141,000	280,000	242,000	192,000	97,000	32,500	26,400
24	65,000	257,000	68,700	42,600	39,300	143,000	310,000	223,000	222,000	88,400	31,500	28,700
25	61,000	227,000	59,000	41,700	40,900	126,000	353,000	227,000	277,000	80,000	31,000	28,300
26	60,000	202,000	50,100	40,900	51,500	137,000	368,000	195,000	296,000	73,000	30,500	27,200
27	53,300	175,000	41,100	40,100	77,000	133,000	341,000	185,000	277,000	68,000	30,000	26,800
28	49,700	153,000	36,700	39,300	92,900	135,000	288,000	177,000	224,000	64,000	31,000	26,400
29	42,600	139,000	36,300	38,500	-------	158,000	246,000	154,000	190,000	62,000	30,500	25,800
30	40,100	130,000	36,300	37,700	-------	160,000	220,000	120,000	162,000	60,000	29,500	25,500
31	47,000	-------	43,400	36,900	-------	153,000	-------	107,000	-------	57,000	29,100	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	66,000	26,600	41,100	2,530,000
November	308,000	36,900	134,000	7,970,000
December	120,000	34,100	66,700	4,100,000
January	64,000	32,400	44,000	2,710,000
February	92,900	26,600	36,800	2,040,000
March	282,000	107,000	155,000	9,530,000
April	368,000	135,000	227,000	13,500,000
May	395,000	107,000	227,000	14,000,000
June	407,000	114,000	256,000	15,200,000
July	197,000	57,000	113,000	6,950,000
August	70,000	29,100	43,200	2,660,000
September	32,500	25,500	28,100	1,670,000
The year	407,000	25,500	114,000	82,860,000

Digitized by Google

GRASSHOPPER CREEK BASIN

GRASSHOPPER CREEK NEAR DILLON, MONT.

LOCATION.—Chain gage in NW. ¼ sec. 26, T. 8 S., R. 10 W., 5 miles above Barratts and 14 miles above Dillon.

DRAINAGE AREA.—360 square miles.

RECORDS AVAILABLE.—March, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 172 second-feet June 18 (gage height, 5.45 feet); minimum (estimated), 3 second-feet Aug. 20–28.

1921–1929: Maximum discharge, 557 second-feet June 5, 1925 (gage height, 6.52 feet); minimum. 0.5 second-foot Aug. 28 to Sept. 3, 1924 (gage height, 3.85 feet).

REMARKS.—Records good except those for Nov. 16–19, 28–30, and Aug. 20–28, which are estimated. Observations discontinued Dec. 1 to Mar. 9 and Sept. 15–30. Numerous small diversions above gage.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept
1	13	37	-------	73	64	51	29	8	6
2	13	37	-------	70	76	59	26	27	6
3	14	37	-------	128	82	61	24	22	5
4	14	37	-------	96	82	64	21	18	5
5	16	37	-------	128	82	43	19	16	5
6	17	37	-------	96	82	43	19	15	6
7	19	37	-------	67	82	48	22	15	6
8	18	37	-------	64	85	53	21	14	7
9	21	37	-------	59	82	61	18	13	7
10	21	37	26	53	79	73	18	11	7
11	22	33	30	48	73	76	15	10	7
12	24	35	32	43	73	73	7	10	8
13	24	35	28	43	79	73	7	9	8
14	24	37	23	51	89	76	7	9	8
15	26	37	26	59	82	79	11	7	-------
16	29	37	28	61	82	96	14	7	-------
17	33	37	28	85	85	161	10	7	-------
18	33	37	28	107	89	172	10	7	-------
19	31	37	28	118	99	161	11	6	-------
20	31	37	28	92	107	161	14	3	-------
21	31	35	28	96	110	114	19	3	-------
22	31	33	26	103	118	89	18	3	-------
23	31	33	25	110	139	73	14	3	-------
24	31	33	26	96	161	59	16	3	-------
25	33	33	28	67	139	51	15	3	-------
26	33	33	30	85	128	51	13	3	-------
27	33	33	32	96	118	43	13	3	-------
28	33	33	40	99	103	41	11	3	-------
29	33	30	36	107	92	39	10	4	-------
30	35	30	90	92	82	33	9	5	-------
31	35	-------	56	-------	59	-------	9	6	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	35	13	25.9	1,590
November	37	30	35.3	2,100
March 10–31	90	23	32.6	1,420
April	128	43	83.1	4,940
May	161	59	93.6	5,760
June	172	33	75.9	4,520
July	29	7	15.2	935
August	27	3	8.8	541
September 1–14	8	5	6.5	180

Digitized by Google

RUBY RIVER BASIN

RUBY RIVER NEAR ALDER, MONT.

LOCATION.—Staff gage in SW. ¼ sec. 21, T. 6 S., R. 4 W., 1,000 feet below highway bridge and 1½ miles south of Alder.
RECORDS AVAILABLE.—April to September, 1929.
EXTREMES.—Maximum discharge during period, 745 second-feet May 25 (gage height, 3.55 feet); minimum, 5.0 second-feet Aug. 30 (gage height, 0.50 foot).
REMARKS.—Records good. Numerous diversions above station.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	147	336	112	17	10	16	------	213	409	74	19	85
2	------	138	409	104	17	11	17	------	239	472	79	19	79
3	------	138	239	82	16	13	18	------	226	409	68	19	76
4	------	147	213	79	17	17	19	------	266	350	213	21	62
5	------	138	226	79	25	27	20	------	336	322	167	19	79
6	------	129	294	74	29	34	21	------	379	294	189	25	81
7	------	129	350	68	19	68	22	------	505	294	112	23	129
8	------	120	409	65	19	74	23	------	606	266	68	16	97
9	------	129	409	54	23	79	24	------	572	213	65	16	104
10	------	120	440	51	16	82	25	------	745	213	41	14	104
11	------	120	350	41	19	85	26	------	538	189	41	16	104
12	------	120	379	31	19	82	27	------	350	167	41	11	112
13	------	213	350	23	17	82	28	147	322	167	17	7.4	112
14	------	239	409	41	17	79	29	157	294	147	17	6.2	112
15	------	213	409	41	16	76	30	167	213	147	19	5.0	104
							31	------	266	------	19	8.6	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 28–30	167	147	157	934
May	745	120	268	16,500
June	472	147	309	18,400
July	213	17	70.2	4,320
August	29	5.0	17.1	1,050
September	129	10	75.3	4,490
The period				45,700

Digitized by Google

BIG HOLE RIVER BASIN

BIG HOLE RIVER NEAR MELROSE, MONT.

LOCATION.—Chain gage in SE. ¼ sec. 27, T. 3 S., R. 9 W., at highway bridge at Browns siding on Oregon Short Line Railroad 6 miles south of Melrose.

RECORDS AVAILABLE.—March, 1924, to September, 1929.

EXTREMES.—Maximum discharge during year, 7,100 second-feet June 19 (gage height, 6.38 feet); minimum, 216 second-feet Mar. 26 (gage height, 1.12 feet).

1924–1929: Maximum stage, from high-water mark, 14.0 feet June 10, 1927 (discharge not determined); minimum discharge, that of Mar. 26, 1929.

REMARKS.—Records good except those for Dec. 2–4, Mar. 31, and Apr. 2–13, which are estimated. Observations discontinued Dec. 17 to Mar. 16. Some small diversions above station. Flow partly regulated.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	460	500	365		327	1,570	3,030	1,860	449	288
2	480	525	353			1,260	3,370	1,640	449	300
3	500	500	341			1,210	3,200	1,570	449	288
4	500	500	329			1,160	3,030	1,440	428	288
5	500	500	318			1,060	2,860	1,440	428	288
6	550	525	340			1,000	3,200	1,210	428	276
7	550	460	340			1,060	3,540	1,060	428	276
8	525	460	352		330	1,100	4,040	1,000	410	276
9	500	500	340			1,100	4,220	1,060	391	288
10	525	580	352			1,160	4,400	960	374	300
11	500	500	352			1,210	4,580	915	374	288
12	500	500	365			1,380	4,940	798	357	288
13	480	480	365			1,640	4,940	760	342	288
14	525	460	365		327	2,020	5,120	691	342	276
15	580	480	379		357	1,860	5,120	691	327	276
16	610	460	379		410	1,710	5,880	659	314	276
17	610	460		357	517	2,020	6,680	659	300	276
18	645	379		300	569	2,180	6,890	659	300	276
19	645	379		300	659	2,520	7,100	691	288	276
20	610	460		288	760	2,690	5,500	691	288	276
21	610	460		300	875	2,860	4,760	835	276	276
22	580	442		288	1,000	3,370	3,870	659	276	288
23	550	442		288	1,260	4,040	3,870	627	265	288
24	550	425		288	1,100	4,040	3,030	598	254	300
25	550	409		225	1,160	4,040	2,690	543	265	300
26	525	393		216	1,260	4,040	2,860	517	254	300
27	500	425		494	2,350	4,040	2,690	470	254	314
28	500	460		470	1,640	3,540	2,690	470	265	314
29	525	409		428	3,030	3,030	2,520	449	254	327
30	500	379		410	2,860	2,860	2,350	449	254	327
31	500			368		2,690		449	265	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	645	460	538	33,100
November	580	379	462	27,500
December 1–16	379	318	352	11,200
March 17–31	494	216	335	9,970
April	3,030	327	814	48,400
May	4,040	1,000	2,240	138,000
June	7,100	2,350	4,080	243,000
July	1,860	449	855	52,600
August	449	254	334	20,500
September	327	276	290	17,300

Digitized by Google

BOULDER RIVER BASIN

BOULDER RIVER NEAR BOULDER, MONT.

LOCATION.—Wire gage in sec. 32, T. 6 N., R. 4 W., at highway bridge 2 miles southeast of Boulder.

RECORDS AVAILABLE.—April to September, 1929.

EXTREMES.—Maximum discharge during period, 1,480 second-feet May 25 (gage height, 9.90 feet); minimum, 8 second-feet Aug. 20 and 22 (gage height, 5.80 feet).

REMARKS.—Records good. Discharge estimated July 12–14, Aug. 4, and 5. Numerous diversions above station.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	250	978	222	14	14	16	------	502	778	90	14	22
2	------	280	1,080	196	22	14	17	------	682	978	84	22	52
3	------	382	878	172	22	14	18	------	682	778	78	41	22
4	------	346	778	140	22	22	19	------	778	730	72	14	14
5	------	346	928	130	22	31	20	------	878	636	66	8	22
6	------	150	828	130	22	22	21	------	1,080	590	61	18	31
7	------	150	878	150	22	22	22	------	1,200	546	56	8	41
8	------	150	928	196	14	14	23	------	1,300	460	51	14	31
9	------	196	828	172	22	14	24	------	1,420	420	46	14	41
10	------	172	778	130	31	22	25	------	1,480	382	41	14	52
11	------	209	978	120	18	31	26	------	1,080	382	26	14	52
12	------	346	878	114	14	31	27	------	928	346	22	11	52
13	------	502	778	108	18	41	28	------	878	280	22	22	65
14	------	502	682	102	8	22	29	546	778	280	22	22	65
15	------	460	636	96	14	22	30	382	730	250	22	14	52
							31	------	878	------	22	14	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 29–30	546	382	464	1,840
May	1,480	150	633	38,900
June	1,080	250	689	41,000
July	222	22	95.5	5,870
August	41	8	17.7	1,090
September	65	14	31.7	1,890
The period				90,600

Digitized by Google

SOUTH BOULDER CREEK BASIN

SOUTH BOULDER CREEK NEAR JEFFERSON ISLAND, MONT.

LOCATION.—Water-stage recorder in sec. 18, T. 2 S., R. 3 W., 200 feet above headworks of power pipe line of Liberty-Montana Mines Co. and 16 miles southwest of Jefferson Island.

RECORDS AVAILABLE.—May, 1926, to September, 1929.

EXTREMES.—Maximum discharge during year, 434 second-feet June 16 (gage height, 3.50 feet); minimum, 2.0 second-feet Apr. 12 (gage height, 0.90 foot).

1926-1929: Maximum and minimum discharge, same as given above.

REMARKS.—Records good except those for estimated periods, which are fair. No diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15.0	10.6							114	152	47	23
2	15.0	11.0							112	145	46	25
3	15.5	16.0							105	*136	44	23
4	15.0								101	*127	41	23
5	15.5		11.0						107	*119	38	23
6	15.5							*4.5	128	111	38	23
7	15.0			10.2					152	105	37	22
8	15.0					4.6			163	89	35	21
9	15.0								171	84	34	22
10	15.0	12.0	8.4		10.2				177	88	31	23
11	13.5			11.0				5.8	179	89	29	23
12	14.0						2.0	*8.2	181	89	28	22
13	18.0							*10.6	194	85	27	21
14						2.8		13	220	84	27	21
15					5.2		2.8	*16	211	83	26	23
16		11.0	8.4					*21	310	83	26	21
17								*26	169	83	25	21
18								*33	125	79	26	21
19				8.4		4.0		40	108	79	25	20
20								47	100	79	26	23
21	15.0				4.6		4.0	63	101	71	25	28
22		12.0						80	101	69	25	25
23				7.0				101	*113	66	25	26
24								127	*125	61	26	26
25						3.2		130	138	61	27	26
26								114	152	61	26	26
27					4.0			96	146	57	27	25
28								85	171	52	27	*25
29		11.0		7.8				79	173	51	28	*25
30	12.0							78	163	48	28	*25
31	10.6							87		48	25	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	18.0	10.6	14.8	910
November			*11.0	655
December			*9.0	553
January			*8.0	492
February			*6.5	361
March			*3.5	215
April			*3.0	179
May	130	4.5	42.1	2,590
June	310	101	150	8,930
July	152	48	85.0	5,230
August	47	25	30.5	1,880
September	28	21	23.4	1,390
The year	310		32.3	23,400

* Estimated.

Digitized by Google

WILLOW CREEK BASIN

WILLOW CREEK NEAR WILLOW CREEK, MONT.

LOCATION.—Wire gage in SW. ¼ sec. 18, T. 1 S., R. 1 E., at highway bridge 7 miles south of Willow Creek.

DRAINAGE AREA.—164 square miles.

RECORDS AVAILABLE.—September, 1919, to September, 1929.

EXTREMES.—Maximum discharge during year, 222 second-feet June 24 (gage height, 3.00 feet); minimum, 11 second-feet Aug. 27 (gage height, 1.10 feet). 1919–1929: Maximum discharge, 456 second-feet June 21 and 22, 1922 (gage height, 3.40 feet); minimum, 3 second-feet Nov. 27, 1926.

REMARKS.—Records fair prior to Apr. 25 and good thereafter. Observations discontinued Dec. 1 to Mar. 29. Numerous diversions above and below station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	43		60	82	82	105	34	17
2	25	45		59	82	82	105	34	17
3	20	43		58	82	76	88	32	18
4	21	47		58	82	71	82	30	20
5	20	45		55	82	76	66	32	21
6	21	39		53	88	71	71	32	23
7	24	38		58	88	71	71	30	21
8	21	36		60	88	71	66	26	24
9	21	34		66	93	71	54	26	24
10	25	34		59	88	71	45	23	27
11	28	36		56	82	66	43	23	26
12	27	34		58	82	66	41	23	24
13	27	29		53	93	82	39	20	24
14	28	27		57	117	129	53	18	23
15	30	27		60	117	180	71	18	22
16	30	26		58	123	194	58	17	22
17	28	27		60	135	194	54	16	21
18	31	24		66	123	194	51	17	21
19	33	26		71	129	194	46	17	23
20	28	27		71	129	194	46	16	24
21	33	26		76	135	194	45	16	28
22	33	24		71	135	208	46	15	50
23	31			88	141	208	45	15	71
24	31			71	167	222	43	15	49
25	30			66	180	154	52	13	43
26	33	25		71	194	105	48	13	37
27	35			76	194	105	43	11	41
28	35			82	154	117	41	17	42
29	37			82	117	117	39	21	43
30	37		40	82	111	105	37	18	45
31	38		50		105		36	17	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	38	20	28.5	1,750
November	47	24	31.2	1,860
April	88	53	65.4	3,890
May	194	82	117	7,190
June	222	66	126	7,500
July	105	36	55.8	3,430
August	34	11	21.1	1,300
September	71	17	29.7	1,770

Digitized by Google

MADISON RIVER BASIN

MADISON RIVER NEAR WEST YELLOWSTONE, MONT.

LOCATION.—Water-stage recorder just north of highway to West Yellowstone, and 4 miles east of West Yellowstone and west boundary of Yellowstone National Park. Staff gage at Riverside ranger station, 3 miles downstream, was used from Dec. 1 to Apr. 20.

DRAINAGE AREA.—410 square miles.

RECORDS AVAILABLE.—June, 1913, to September, 1929.

EXTREMES.—Maximum discharge during year, 1,330 second-feet May 25 (gage height, 2.02 feet); minimum, 327 second-feet Aug. 31 (gage height, 1.13 feet).
1913–1929: Maximum discharge, 1,950 second-feet June 10, 1917; minimum, 284 second-feet Feb. 2, 1924.

REMARKS.—Records good except those for estimated periods, which are fair. No diversions or regulation above station. Attendant for recorder and observer for staff gage furnished by National Park Service.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	452	424	434	• 424	434	• 425	• 413	• 520	840	522	433	• 333
2	433	414	434	424	434	424	• 413	• 510	902	484	433	• 338
3	462	424	434	424	• 434	• 426	413	• 510	802	475	414	• 344
4	471	433	424	424	434	• 429	• 408	• 510	710	471	424	• 350
5	471	433	434	424		• 432	402	• 500	732	462	442	• 355
6	462	462	• 434	• 422		434	402	• 500	815	452	414	361
7	462	442	• 434	• 420		• 434	• 402	• 500	828	452	395	395
8	452	442	434	• 417		434	• 402	• 500	828	462	395	386
9	433	433	• 434	• 415		434	402	• 500	890	442	378	386
10	452	433	434	413	• 400	• 431	402	• 500	878	433	378	386
11	480	414	444	402		• 427	• 397	• 500	852	433	378	386
12	452	404	434	392		424	392	• 550	890	424	370	386
13	471	414	434	• 397		424	392	• 590	828	• 438	378	378
14	471	414	434	• 401		• 420	402	602	840	452	378	378
15	452	404	424	• 406		• 417	• 418	560	828	452	378	370
16	462	386	• 418	• 410	392	413	• 434	570	• 900	433	386	370
17	452	395	413	• 415	382	• 418	• 450	602	• 850	424	386	361
18	490	386	413	• 419	• 391	424	466	570	• 800	414	395	361
19	452	• 390	413	424	• 399	424	• 477	622	• 750	414	386	370
20	442	• 393	413		• 408	424	488	686	• 700	424	370	370
21	462	• 397	• 413		• 417	402	• 475	767	• 675	424	370	424
22	452	• 401	• 413		• 425	392	• 470	828	654	414	370	• 424
23	433	• 404	• 413		434	• 399	• 460	928	675	404	370	• 424
24	433	• 408	• 413		• 433	• 406	• 455	1,020	664	404	370	• 424
25	433	• 412	• 413	• 420	• 431	413	• 450	1,220	664	404	361	• 424
26	433	• 416	413		• 430	413	• 450	978	654	404	352	• 424
27	433	• 419	413		• 428	• 418	• 450	790	633	395	370	• 424
28	433	• 423	434		• 427	424	• 475	721	612	395	344	424
29	433	• 427	434		-------	• 418	• 525	710	602	386	344	• 425
30	433	• 430	424		-------	413	• 525	654	560	395	370	• 425
31	433	-------	424		-------	• 413	-------	710	-------	414	327	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	490	433	451	1.10	1.27	27,700
November	462	386	416	1.01	1.13	24,800
December	444	413	425	1.04	1.20	26,100
January	----------	392	417	1.02	1.18	25,600
February	----------	382	412	1.00	1.04	22,900
March	434	392	420	1.02	1.18	25,800
April	525	392	437	1.07	1.19	26,000
May	1,220	500	653	1.59	1.83	40,200
June	902	560	762	1.86	2.08	45,300
July	522	386	432	1.05	1.21	26,600
August	442	327	383	.934	1.08	23,600
September	425	333	387	.944	1.05	23,000
The year	1,220	327	466	1.14	15.44	338,000

• Estimated.

Digitized by Google

MADISON RIVER AT LYON, MONT.

LOCATION.—Staff gage in SE. ¼ sec. 29, T. 10 S., R. 1 E., at highway bridge at Lyon.

RECORDS AVAILABLE.—August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 3,360 second-feet several days during August (gage height, 2.40 feet); minimum, 385 second-feet July 9 (gage height, 0.65 foot).

1928–29: Maximum and minimum discharge, same as given above.

REMARKS.—Records good. No diversions. Complete regulation at Hebgen Reservoir.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,470	950	950	2,090	2,190	2,190	950	680	1,020	810	2,700	3,130
2	1,160	950	950	1,900	2,290	2,190	950	680	680	810	2,910	3,130
3	1,090	1,090	950	1,900	2,090	2,190	1,020	745	810	680	2,910	3,020
4	1,090	1,020	950	2,090	2,190	2,390	950	745	810	680	2,910	2,910
5	1,090	1,090	950	2,090	2,290	2,700	1,090	680	1,090	584	2,910	2,800
6	1,160	1,090	1,090	1,900	2,290	2,700	950	680	1,390	500	2,910	2,700
7	1,320	1,090	1,060	1,720	2,490	2,090	950	680	1,550	440	2,910	2,700
8	1,470	1,090	1,060	1,720	2,490	2,090	1,090	706	1,810	440	3,130	2,700
9	1,390	1,090	1,240	1,470	2,290	2,090	1,090	745	2,190	385	3,130	2,700
10	1,320	1,020	1,240	1,240	2,290	1,720	950	784	2,190	418	3,130	2,700
11	1,240	1,020	1,240	1,160	2,290	1,470	1,090	810	2,000	810	2,700	2,700
12	1,240	1,090	1,240	1,090	2,090	1,320	950	810	1,720	950	2,910	2,700
13	1,090	1,160	1,090	1,160	2,090	1,240	950	810	1,470	1,160	3,360	2,620
14	1,020	1,240	1,240	1,160	2,290	1,240	950	745	1,390	1,240	3,360	2,490
15	1,020	1,210	1,240	1,090	2,290	1,240	950	810	1,720	1,090	3,130	2,490
16	1,090	810	1,240	950	2,390	1,240	1,090	784	1,550	1,090	3,130	2,290
17	1,090	745	1,160	1,020	2,700	1,240	950	706	1,240	1,240	3,130	2,290
18	1,090	745	1,090	950	1,720	1,240	950	745	1,240	1,390	3,130	2,190
19	1,060	810	1,320	950	1,720	1,240	1,020	950	950	1,720	3,360	2,090
20	978	810	1,240	1,020	1,900	1,090	950	1,240	620	1,720	3,360	2,090
21	950	838	1,240	1,240	1,900	950	950	1,390	880	1,390	3,240	2,090
22	880	978	1,160	1,470	1,900	950	950	1,550	810	1,550	3,360	2,090
23	810	1,020	1,090	1,720	1,900	950	680	1,810	1,090	1,550	3,360	2,290
24	680	978	1,240	2,000	1,900	950	680	2,000	1,240	1,720	3,360	2,290
25	1,090	1,060	1,390	2,090	1,900	1,020	810	1,210	1,390	1,720	3,130	2,090
26	1,090	1,090	1,390	2,390	1,900	1,160	745	1,120	1,390	2,090	3,130	2,190
27	1,090	1,020	1,390	2,490	1,900	1,090	810	1,020	1,390	2,090	3,130	2,090
28	1,020	838	1,390	2,490	2,090	1,020	680	745	1,390	2,090	3,020	2,090
29	1,090	880	1,390	2,490	-------	950	680	880	1,390	2,090	2,910	1,550
30	950	950	1,640	2,290	-------	950	745	880	1,090	2,290	2,800	1,390
31	978	-------	1,810	2,190	-------	950	-------	950	-------	2,290	2,910	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,470	680	1,100	67,600
November	1,240	745	992	59,000
December	1,810	950	1,220	75,000
January	2,490	950	1,660	102,000
February	2,700	1,720	2,130	118,000
March	2,700	950	1,480	91,000
April	1,090	680	919	54,700
May	2,000	680	938	57,700
June	2,190	620	1,320	78,600
July	2,290	385	1,260	77,500
August	3,360	2,700	3,080	189,000
September	3,130	1,390	2,420	144,000
The year	3,360	385	1,540	1,110,000

Digitized by Google

MADISON RIVER NEAR THREE FORKS, MONT.

LOCATION.—Wire gage in sec. 29, T. 2 N., R. 2 E., at highway bridge 1½ miles east of Three Forks.

RECORDS AVAILABLE.—November, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 3,280 second-feet Sept. 4 (gage height, 3.58 feet); minimum, 795 second-feet Nov. 19 (gage height, 2.34 feet).

REMARKS.—Records good except those for periods of ice effect, Dec. 3–13, 22–31, and Jan. 1–6, which are fair. Observations discontinued Jan. 17 to Mar. 12. Flow regulated for power by storage in Hebgen Reservoir and by Madison River power dam. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Nov.	Dec.	Jan.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-------	1,100	2,430	-------	1,610	1,610	1,610	1,540	2,440	3,130
2	-------	840		-------	1,610	1,610	1,610	1,470	2,440	3,130
3	-------	880		-------	1,540	1,610	1,610	1,540	2,700	3,130
4	-------	920		-------	1,540	1,610	1,610	1,470	3,130	3,280
5	-------	960		-------	1,610	1,610	1,610	1,470	3,130	3,130
6	-------	1,000		-------	1,610	1,610	1,610	1,240	2,980	3,130
7	-------	1,040	2,570	-------	1,610	1,610	1,540	1,140	2,980	3,130
8	1,040	1,080	2,570	-------	1,610	1,610	1,540	1,040	3,130	3,130
9	1,040	1,120	2,570	-------	1,610	1,610	1,610	1,090	2,980	2,980
10	1,040	1,160	2,440	-------	1,540	1,540	1,610	1,090	3,130	2,840
11	1,040	1,200	2,200	-------	1,540	1,540	1,610	1,090	3,130	2,700
12	1,210	1,240	2,200	-------	1,540	1,540	1,610	1,090	3,130	2,700
13	1,390	1,280	1,980	1,880	1,540	1,540	1,610	1,140	2,980	2,700
14	1,390	1,310	1,980	1,780	1,540	1,540	1,700	1,300	3,130	2,700
15	1,310	1,310	1,700	1,700	1,610	1,540	1,700	1,240	3,130	2,700
16	1,270	1,310	1,540	1,610	1,610	1,610	1,780	1,240	2,980	2,700
17	1,270	1,390	-------	1,610	1,610	1,610	1,880	1,240	2,980	2,700
18	1,040	1,310	-------	1,610	1,610	1,610	2,700	1,190	2,980	2,700
19	795	1,570	-------	1,610	1,610	1,610	2,440	1,140	3,130	2,700
20	1,040	1,570	-------	1,610	1,610	1,610	1,980	1,140	3,130	2,570
21	1,310	1,750	-------	1,610	1,610	1,610	2,200	1,470	3,130	2,570
22	1,210		-------	1,610	1,540	1,610	2,440	1,540	3,130	2,570
23	1,310		-------	1,610	1,610	1,610	1,610	1,700	3,130	2,570
24	1,040		-------	1,610	1,540	1,610	1,610	1,780	3,130	2,440
25	1,040		-------	1,610	1,610	1,610	1,610	1,880	3,130	2,440
26	840	2,020	-------	1,610	1,540	1,610	1,610	1,980	2,980	2,320
27	1,270		-------	1,540	1,610	1,610	1,350	2,090	3,130	2,320
28	990		-------	1,610	1,610	1,610	1,350	2,090	3,130	2,320
29	990		-------	1,610	1,610	1,610	1,470	2,090	3,130	2,320
30	1,040		-------	1,610	1,610	1,610	1,540	2,200	3,130	2,320
31	-------		-------	1,610	-------	1,610	-------	2,440	3,130	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
November 8–30	1,390	795	1,130	51,600
December	----------	840	1,470	90,400
January 1–16	----------	1,540	2,270	72,000
March 13–31	1,880	1,610	1,630	61,400
April	1,610	1,540	1,590	94,600
May	1,610	1,540	1,600	98,400
June	2,700	1,350	1,730	103,000
July	2,440	1,090	1,490	91,600
August	3,130	2,440	3,030	186,000
September	3,280	2,320	2,740	163,000

Digitized by Google

GALLATIN RIVER BASIN

GALLATIN RIVER AT LOGAN, MONT.

LOCATION.—Wire gage at highway bridge in sec. 26, T. 2 N., R. 2 E., half a mile west of Logan.

RECORDS AVAILABLE.—August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 4,570 second-feet June 17 (gage height, 6.44 feet); minimum, 265 second-feet Aug. 5 (gage height, 2.56 feet). 1928–29: Maximum and minimum discharge, same as given above.

REMARKS.—Records excellent except those for period of ice effect, Dec. 6 to Mar. 2, which are fair. Discharge estimated Sept. 21–28.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	695	945	790	645	800	620	758	988	2,120	2,120	305	370
2	725	865	790	735	870	620	828	905	2,820	1,870	285	370
3	725	828	758	675	905	638	1,210	945	2,670	1,750	285	392
4	790	865	695	675	800	638	1,080	905	2,250	1,520	285	415
5	790	905	638	675	735	725	1,030	905	2,120	1,310	265	415
6	758	945	705	705	620	1,030	945	828	2,250	1,210	285	460
7	790	945	705	735	545	1,030	865	828	2,670	945	285	460
8	790	945	765	765	480	1,120	790	790	2,820	865	325	460
9	790	945	765	765	430	905	758	790	3,130	758	325	460
10	828	945	835	765	465	1,030	758	905	3,130	665	305	460
11	865	945	735	765	500	1,120	758	865	3,130	560	305	485
12	945	905	705	735	480	905	725	828	3,130	560	305	485
13	865	905	735	735	500	790	758	865	3,130	535	325	460
14	945	988	800	705	480	725	790	1,160	3,130	560	305	460
15	945	945	675	705	500	695	865	1,210	3,810	610	305	460
16	945	905	675	675	525	665	905	1,160	4,370	585	285	485
17	945	905	705	675	500	695	945	1,310	4,370	585	305	485
18	988	905	735	675	500	725	945	1,520	3,630	560	348	485
19	988	828	800	620	500	725	905	1,630	3,290	560	348	510
20	988	865	735	620	480	695	945	1,870	2,670	610	325	510
21	988	905	705	570	765	725	1,030	1,990	2,670	610	325	524
22	988	865	735	525	620	725	1,030	2,390	2,390	560	325	538
23	988	865	675	430	465	725	905	2,820	2,390	535	325	553
24	945	865	705	395	480	665	988	3,460	2,390	510	325	567
25	945	828	735	290	525	665	865	4,180	2,390	665	325	581
26	945	865	835	500	545	695	828	3,460	2,390	392	325	596
27	945	865	705	595	525	790	790	2,820	2,530	325	325	610
28	945	865	735	645	620	905	865	2,390	2,390	305	325	624
29	905	758	705	705	-------	758	865	2,250	2,390	305	348	638
30	905	725	675	800	-------	1,030	1,030	1,870	2,390	285	370	638
31	945	-------	675	800	-------	865	-------	1,870	-------	285	392	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	988	695	889	54,700
November	988	725	888	52,800
December	835	638	730	44,900
January	800	290	655	40,300
February	905	430	577	32,000
March	1,120	620	795	48,900
April	1,210	725	892	53,100
May	4,180	790	1,640	101,000
June	4,370	2,120	2,830	168,000
July	2,120	285	759	46,700
August	392	265	317	19,500
September	638	370	499	29,700
The year	4,370	265	955	692,000

Digitized by Google

CROW CREEK BASIN

CROW CREEK NEAR RADERSBURG, MONT.

LOCATION.—Water-stage recorder in NE. ¼ sec. 23, T. 6 N., R. 1 W., at Glendale ranger station 1 mile above mouth of Slim Sam Creek and 6 miles northwest of Radersburg.

RECORDS AVAILABLE.—April, 1924, to September, 1929; discontinued. May, 1919, to September, 1922, at old location 600 feet below mouth of Slim Sam Creek. Records comparable except during spring run-off.

EXTREMES.—Maximum discharge during year, 537 second-feet May 24 (gage height, 3.42 feet); minimum, 7.2 second-feet Nov. 8 (gage height, 1.00 foot). 1919–1922, 1924–1929: Maximum discharge, 817 second-feet June 8, 1920; minimum, 2.1 second-feet Dec. 13, 1924 (gage height, 0.73 foot).

REMARKS.—Records fair. Discharge estimated Oct. 7–15 and Nov. 2–4. Observations discontinued Nov. 10 to Apr. 25. No diversions above gage.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	13	11	----	30	232	86	23	14
2	12	11	----	29	257	80	25	16
3	16	13	----	32	214	78	25	17
4	16	13	----	34	183	72	28	18
5	16	15	----	32	179	66	24	18
6	15	13	----	30	197	63	22	20
7	15	11	----	28	230	62	22	20
8	15	11	----	27	251	73	21	20
9	15	12	----	30	257	61	20	19
10	15	----	----	31	240	54	19	26
11	15	----	----	33	243	48	18	23
12	15	----	----	49	243	44	17	20
13	15	----	----	78	206	41	16	17
14	15	----	----	84	197	39	16	17
15	15	----	----	75	185	36	15	23
16	15	----	----	87	197	32	15	20
17	18	----	----	105	224	30	16	18
18	20	----	----	122	188	28	17	17
19	17	----	----	141	166	28	17	16
20	16	----	----	153	147	25	17	16
21	15	----	----	251	132	24	16	19
22	14	----	----	333	125	22	16	24
23	14	----	----	414	122	22	16	20
24	13	----	----	448	118	21	16	22
25	13	----	----	363	110	20	15	22
26	13	----	20	340	109	21	15	23
27	13	----	22	181	100	22	15	22
28	13	----	28	160	96	22	15	23
29	13	----	38	147	94	22	15	23
30	14	----	37	140	90	22	17	22
31	14	----	----	172	----	22	14	----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	20	12	14.8	910
November 1–9	15	11	12.2	218
April 26–30	38	20	29.0	286
May	448	27	133	8,180
June	257	90	178	10,600
July	86	20	41.5	2,550
August	28	14	18.2	1,120
September	26	14	19.8	1,180

Digitized by Google

PRICKLY PEAR CREEK BASIN

PRICKLY PEAR CREEK NEAR CLANCY, MONT.

LOCATION.—Staff gage in SW. ¼ sec. 34, T. 9 N., R. 3 W., one-fourth mile below mouth of Lump Gulch Creek and 1¼ miles north of Clancy.

DRAINAGE AREA.—178 square miles.

RECORDS AVAILABLE.—July, 1910, to September, 1916; July, 1921, to September, 1929. July, 1908, to June, 1909, at old site 1 mile below.

EXTREMES.—Maximum discharge during year, 273 second-feet May 22–24 (gage height, 2.6 feet); minimum, 13 second-feet Aug. 25, 26, Sept. 3, 4, and 8 (gage height, 0.71 foot).

1908–1916, 1921–1929: Maximum discharge, 492 second-feet June 3, 1927 (gage height, 3.8 feet); minimum, 9.3 second-feet Sept. 9, 1924 (gage height, 0.71 foot).

REMARKS.—Records good prior to Aug. 6 and fair thereafter. Observations discontinued Nov. 26 to Mar. 5. Several diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	33	-------	41	92	207	50	29	14
2	19	31	-------	41	99	198	50	29	14
3	20	30	-------	42	99	189	51	29	13
4	20	30	-------	53	106	216	51	29	13
5	20	28	-------	44	73	198	50	29	16
6	20	27	43	53	81	198	51	28	20
7	20	30	45	41	85	198	51	28	21
8	20	29	42	48	92	198	51	26	13
9	22	29	46	49	92	172	51	23	14
10	25	26	48	45	73	163	51	23	16
11	28	26	44	43	88	189	51	22	33
12	30	26	43	44	122	198	50	20	40
13	31	25	40	46	138	198	50	19	29
14	31	25	36	54	122	207	44	16	20
15	31	25	45	57	130	172	38	15	22
16	32	25	44	65	122	172	36	14	23
17	35	25	37	58	163	207	34	14	23
18	36	25	36	58	114	172	34	16	22
19	36	25	35	65	146	154	34	16	21
20	32	25	37	59	146	138	32	16	21
21	30	25	38	64	216	122	33	16	22
22	32	25	38	78	273	114	34	15	32
23	30	25	38	76	273	114	34	15	30
24	30	25	48	67	273	99	30	14	32
25	30	26	37	58	254	92	29	13	31
26	30	-------	38	67	216	67	29	13	32
27	30	-------	50	78	235	51	28	*14	33
28	30	-------	62	70	244	51	29	*15	36
29	32	-------	67	85	207	51	29	*15	36
30	33	-------	43	106	207	54	29	16	36
31	32	-------	49	-------	207	-------	29	16	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	36	19	28.0	1,720
November 1–25	33	25	26.8	1,340
March 6–31	67	35	43.4	2,240
April	106	41	58.5	3,480
May	273	73	154	9,470
June	216	51	152	9,040
July	51	28	40.1	2,470
August	29	13	19.5	1,200
September	40	13	24.3	1,450

* Estimated.

Digitized by Google

TENMILE CREEK NEAR RIMINI, MONT.

LOCATION.—Water-stage recorder in NE. ¼ sec. 20, T. 9 N., R. 5 W., at Moose Creek ranger station, 500 feet above mouth of Moose Creek and 3 miles north of Rimini.

DRAINAGE AREA.—34 square miles.

RECORDS AVAILABLE.—March, 1915, to September, 1929.

EXTREMES.—Maximum discharge during year, 400 second-feet May 23 (gage height, 2.58 feet); no flow at times in October, August, and September.

1915–1929: Maximum discharge, 948 second-feet May 15, 1917 (gage height, 4.87 feet); no flow at times in 1928 and 1929.

REMARKS.—Records good. Discharge estimated Oct. 13–17. No record Nov. 13 to Apr. 30. Small diversions above station. Flow partly regulated by reservoir on one tributary above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	May	June	July	Aug.	Day	Oct.	Nov.	May	June	July	Aug.
1	0	0.6	18	201	8.0	1.1	16	4.4	-------	98	72	4.3	0
2	0	.8	18	190	6.9	2.4	17	5.2	-------	114	88	3.1	0
3	0	1.0	21	150	6.1	.5	18	6.1	-------	130	62	1.7	0
4	0	2.1	21	135	5.8	.2	19	4.7	-------	160	60	1.1	0
5	0	1.3	18	145	5.5	.1	20	4.5	-------	187	49	.8	0
6	.3	1.9	16	155	5.3	0	21	3.5	-------	223	39	.6	0
7	.7	2.7	16	155	7.2	0	22	2.7	-------	258	33	.5	0
8	.5	2.4	17	152	9.3	0	23	2.2	-------	313	28	.4	0
9	.4	3.1	21	137	9.3	0	24	2.2	-------	335	24	.3	0
10	.8	1.9	23	120	8.4	0	25	1.7	-------	258	22	1.9	0
11	1.1	2.4	39	118	8.0	0	26	1.7	-------	192	18	1.4	0
12	1.0	.8	50	105	6.4	0	27	1.3	-------	160	16	.4	0
13	1.8	-------	69	86	5.5	0	28	.9	-------	150	13	2.5	0
14	2.7	-------	78	72	5.0	0	29	.6	-------	140	11	1.4	0
15	3.6	-------	82	62	5.5	0	30	.8	-------	142	9.3	.4	0
							31	.3	-------	179	-------	.4	0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	6.1	0	1.80	111
November 1–12	3.1	.6	1.75	50
May	335	16	114	7,010
June	201	9.3	84.2	5,010
July	9.3	.3	3.98	245
August	2.4	0	.14	8.6

NOTE.—No flow during September.

Digitized by Google

TENMILE CREEK NEAR HELENA, MONT.

LOCATION.—Water-stage recorder in SE. ¼ sec. 22, T. 10 N., R. 4 W., opposite Broadwater Hotel, near Helena. Prior to Mar. 16, 1929, gage was 100 feet downstream and at different datum.

DRAINAGE AREA.—103 square miles.

RECORDS AVAILABLE.—July, 1908, to September, 1929.

EXTREMES.—Maximum discharge during year, 450 second-feet May 23 (gage height, 2.70 feet); no flow July 26 to Sept. 19.

1908–1929: Maximum discharge, 865 second-feet May 28, 1917, and June 11, 1927; maximum gage height, 6.58 feet, old datum, June 11, 1927; no flow for several periods during record.

REMARKS.—Records good. Discharge interpolated Mar. 10–16 and June 16–21 and estimated Sept. 7–15. No record Oct. 1 to Mar. 6 and Sept. 25–30. Diversions for irrigation and city water supply of Helena above station.

Daily and monthly discharge, in second-feet, 1928

Day	Mar.	Apr.	May	June	July	Sept.	Day	Mar.	Apr.	May	June	July	Sept.
1	-------	8.7	41	197	22	0	16	5.8	12	112	63	7.0	0
2	-------	11	36	207	20	0	17	5.8	16	130	60	3.7	0
3	-------	11	41	152	18	0	18	5.8	18	137	57	2.4	0
4	-------	12	38	140	15	0	19	5.8	18	177	54	1.0	0
5	4.8	12	36	143	13	0	20	5.8	22	211	51	1.0	.1
6	4.5	12	34	143	11	0	21	5.8	26	261	48	.8	.3
7	4.8	12	33	130	12		22	5.8	27	302	46	.8	.5
8	4.5	11	30	134	14		23	5.8	30	340	45	.6	1.0
9	4.8	7.3	37	137	11		24	5.8	24	336	38	.5	1.3
10	4.9	8.7	39	124	7.3		25	4.7	21	323	32	.1	------
11	5.0	7.0	45	108	7.2	0	26	5.1	22	249	29	0	------
12	5.1	7.3	72	105	7.2		27	6.2	25	215	22	0	------
13	5.2	6.6	92	86	7.1		28	12	38	184	18	0	------
14	5.4	8.2	101	69	7.0		29	15	53	170	17	0	------
15	5.6	11	92	66	7.3		30	12	51	155	21	0	------
							31	12	-------	190	-------	0	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March 5–31	15	4.5	6.44	349
April	53	6.6	18.3	1,090
May	340	30	137	8,420
June	207	17	84.7	5,040
July	22	0	6.35	390
September 1–24	1.3	0	.10	

NOTE.—No flow during August.

Digitized by Google

LITTLE PRICKLY PEAR CREEK BASIN

LITTLE PRICKLY PEAR CREEK NEAR MARYSVILLE, MONT.

LOCATION.—Staff gage in SW. ¼ sec. 18, T. 12 N., R. 6 W., one-fourth mile below mouth of Deadman Creek and 6 miles northwest of Marysville.

DRAINAGE AREA.—69 square miles.

RECORDS AVAILABLE.—May, 1913, to September, 1929. April to May, 1913, at site one-fourth mile upstream. May, 1909, to December, 1911, at station above mouth of Deadman Creek.

EXTREMES.—Maximum discharge during year, 146 second-feet May 24 (gage height, 1.64 feet); minimum, 11 second-feet Nov. 15 to Dec. 16 (gage height, 0.40 foot).

1909–1911, 1913–1929: Maximum discharge, 454 second-feet May 25 and 26, 1917 (gage height, 3.8 feet); minimum, 1.2 second-feet Mar. 7–13, 1911 (gage height, 2.28 feet, old gage).

REMARKS.—Records good prior to July 6 and fair thereafter. Observations discontinued Dec. 17 to Apr. 20. Some diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Apr.	May	June	July	Aug.	Sept.
1	17	15	11	------	22	60	33	16	13
2	17	15	11	------	22	65	32	16	13
3	17	15	11	------	22	68	32	16	13
4	17	15	11	------	22	62	30	16	12
5	17	15	11	------	22	58	29	16	12
6	17	15	11	------	23	56	29	16	12
7	17	15	11	------	24	54	28	16	12
8	17	15	11	------	23	52	28	16	13
9	17	13	11	------	23	52	27	16	13
10	17	13	11	------	25	51	26	16	13
11	17	13	11	------	25	50	25	15	13
12	17	13	11	------	28	50	24	15	13
13	17	13	11	------	38	49	24	15	13
14	17	13	11	------	50	48	22	14	13
15	17	11	11	------	55	48	22	13	13
16	17	11	11	------	57	46	22	13	13
17	17	11	------	------	59	45	22	13	13
18	17	11	------	------	65	45	20	13	12
19	17	11	------	------	71	43	20	13	12
20	17	11	------	------	82	41	19	13	12
21	17	11	------	16	99	41	19	13	12
22	17	11	------	16	113	40	19	13	12
23	16	11	------	16	126	38	19	13	12
24	16	11	------	16	136	38	18	13	12
25	16	11	------	16	136	37	18	13	12
26	16	11	------	16	111	34	18	13	12
27	16	11	------	16	93	33	18	13	15
28	16	11	------	19	79	33	18	13	14
29	16	11	------	20	70	33	17	13	14
30	16	11	------	22	65	33	16	13	14
31	16	------	------	------	61	------	16	13	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	17	16	16.7	1,030
November	15	11	12.5	744
December 1–16	11	11	11	349
April 21–30	22	16	17.3	343
May	136	22	59.6	3,660
June	68	33	46.8	2,780
July	33	16	22.9	1,410
August	16	13	14.2	873
September	15	12	12.7	756

Digitized by Google

DEARBORN RIVER BASIN

DEARBORN RIVER NEAR CLEMONS, MONT.

LOCATION.—Wire gage in NW. ¼ sec. 26, T. 18 N., R. 7 W., 300 feet above highway bridge, 2 miles below mouth of Falls Creek, and 5 miles southwest of Clemons.

DRAINAGE AREA.—122 square miles.

RECORDS AVAILABLE.—April, 1921, to September, 1923; May to September, 1929. May, 1908, to December, 1911, at station half a mile above mouth of Falls Creek.

EXTREMES.—Maximum discharge during year, 958 second-reet May 24 (gage height, 3.11 feet); minimum, 19 second-feet Sept. 24 (gage height, 0.81 foot). 1921–1923, 1929: Maximum discharge, 1,340 second-feet June 6, 1922 (gage height, 3.70 feet); minimum, 10 second-feet Oct. 17–21, 1922 (gage height, 0.84 foot).

REMARKS.—Records good except those for Sept. 24–30, which are fair. Several small diversions above gage.

Daily and monthly discharge, in second-feet, 1929

Day	May	July	Aug.	Sept.	Day	May	July	Aug.	Sept.
1		116	35	24	16		66	25	22
2		111	31	24	17		51	25	22
3		102	31	24	18		39	25	22
4		97	31	24	19		38	25	20
5		97	29	24	20		39	25	20
6		97	28	24	21		41	25	20
7		109	27	24	22		41	25	20
8		95	27	24	23		41	25	20
9		89	27	24	24	*958	41	25	19
10	*152	89	27	24	25		40	25	20
11		86	27	24	26		39	25	23
12		76	25	24	27		38	25	32
13		68	25	23	28		37	25	44
14		68	25	22	29		36	25	44
15		67	25	22	30	*351	37	24	40
					31		37	24	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
July	116	36	65.4	4,020
August	35	24	26.4	1,620
September	44	19	24.8	1,480
The period				7,120

* Result of discharge measurement.

Digitized by Google

SMITH RIVER BASIN

SMITH RIVER NEAR WHITE SULPHUR SPRINGS, MONT.

LOCATION.—Wire gage in SW. ¼ sec. 33, T. 11 N., R. 8 E., at Meachem ranch, 14 miles northeast of White Sulphur Springs.

RECORDS AVAILABLE.—September, 1922, to September, 1929.

EXTREMES.—Maximum discharge during year, 64 second-feet May 24 (gage height, 2.50 feet); minimum, 3.9 second-feet Sept. 1 and 18–20 (gage height, 1.83 feet).

1922–1929: Maximum discharge, 224 second-feet June 21, 1923 (gage height, 3.05 feet); minimum, 3.1 second-feet Mar. 8, 1923.

REMARKS.—Records good except those for periods of ice effect, Nov. 1–9, 11, 12, 15–20, and 23–30, which are fair. Observations discontinued Dec. 1 to Apr. 27. Small diversions above gage.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	12	14	-------	29	39	25	12	3.9
2	12	14	-------	25	54	25	13	5.1
3	13	14	-------	23	58	22	14	5.1
4	14	13	-------	25	56	21	14	5.1
5	13	13	-------	23	54	21	14	5.1
6	12	13	-------	22	48	21	11	5.1
7	12	13	-------	23	50	21	11	5.5
8	12	12	-------	26	50	20	11	5.8
9	12	12	-------	25	46	20	11	5.8
10	13	12	-------	25	46	16	9.2	5.8
11	12	12	-------	25	48	14	9.7	5.8
12	14	13	-------	27	44	14	9.2	5.5
13	18	13	-------	25	40	14	9.2	5.5
14	12	9	-------	25	40	15	8.4	5.1
15	13	9	-------	21	40	14	8.4	5.1
16	12	10	-------	21	39	14	8.4	4.7
17	13	10	-------	20	42	12	7.9	4.7
18	12	11	-------	20	40	12	7.9	3.9
19	13	11	-------	21	36	12	8.4	3.9
20	10	12	-------	22	33	13	7.9	3.9
21	10	12	-------	30	31	10	7.5	4.7
22	10	14	-------	42	29	9.7	7.0	5.8
23	9.5	-------	-------	48	28	9.7	7.0	6.2
24	10	-------	-------	64	24	11	7.0	7.5
25	9.5	-------	-------	59	24	11	6.2	7.5
26	9.5	-------	-------	62	21	10	5.5	7.0
27	10	-------	-------	59	20	7.5	4.7	7.0
28	10	-------	46	59	20	11	4.7	7.0
29	10	-------	46	45	20	11	5.1	6.2
30	13	-------	31	36	24	11	4.3	6.6
31	14	-------	-------	36	-------	12	4.3	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	18	9.5	11.9	732
November 1-22	14	9.0	12.1	528
May	64	20	32.7	2,010
June	58	20	38.1	2,270
July	25	7.5	14.8	910
August	14	4.3	8.67	533
September	7.5	3.9	5.53	329

Digitized by Google

SMITH RIVER AT TRULY, MONT.

LOCATION.—Wire gage at highway bridge in SW. ¼ sec. 35, T. 9 N., R. 2 E., at former post office of Truly.

RECORDS AVAILABLE.—March, 1905, to June, 1907; March to September, 1929.

EXTREMES.—Maximum discharge during year, 2,500 second-feet May 25 (gage height, 4.90 feet); minimum, 64 second-feet Sept. 1 and 2 (gage height, 1.03 feet).

1905–1907, 1929: Maximum discharge, 4,010 second-feet June 24, 1907 (gage height, 9.00 feet, old datum); minimum, 26 second-feet Sept. 22–28, 1905 (gage height, 1.15 feet).

REMARKS.—Records good. Several diversions above station.

Daily and monthly discharge, in second-feet, 1929

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1		392	983	1,740	501	127	64
2		352	913	2,200	478	135	64
3		392	913	2,200	456	142	74
4		413	848	1,820	434	142	81
5		434	848	1,640	413	137	93
6		392	788	1,560	413	127	97
7		352	730	1,460	456	119	100
8		352	730	1,560	501	114	100
9		352	788	1,640	478	112	112
10		275	913	1,640	434	109	122
11		294	913	1,640	392	107	112
12		313	1,130	1,640	372	102	112
13		313	1,560	1,560	352	97	112
14		313	1,740	1,460	332	95	112
15		352	1,460	1,290	332	91	109
16		352	1,380	1,290	313	89	107
17		478	1,560	1,290	294	89	105
18		548	1,560	1,290	275	81	100
19		572	1,560	1,130	257	81	97
20	239	597	1,640	1,060	239	79	97
21	275	674	1,820	913	229	79	100
22	275	730	2,110	848	215	77	117
23	189	788	2,200	788	192	75	117
24	167	730	2,400	730	179	70	137
25	173	622	2,500	702	167	70	148
26	189	597	2,200	648	162	70	189
27	222	674	2,020	597	153	69	189
28	332	848	1,820	597	142	69	205
29	674	1,130	1,640	548	137	68	189
30	572	1,210	1,460	501	129	66	189
31	434	-------	1,460	-------	129	66	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March 20–31	674	167	312	7,430
April	1,210	275	528	31,400
May	2,500	730	1,440	88,500
June	2,200	501	1,270	75,600
July	501	129	308	18,900
August	142	66	95.3	5,860
September	205	64	118	7,020
The period	-------	-------	-------	235,000

Digitized by Google

MARIAS RIVER BASIN

MARIAS RIVER NEAR SHELBY, MONT.

LOCATION.—Water-stage recorder in sec. 20, T. 31 N., R. 2 W., at highway bridge 7 miles south of Shelby. Gage moved 100 feet downstream Nov. 28, 1929.

DRAINAGE AREA.—2,610 square miles.

RECORDS AVAILABLE.—April, 1902, to January, 1908; April, 1911, to September, 1929.

EXTREMES.—Maximum discharge during year, 4,460 second-feet June 3 (gage height, 6.16 feet); minimum, 161 second-feet Aug. 21 (gage height, 2.00 feet).

1902–1908, 1911–1929: Maximum discharge 29,500 second-feet June 24, 1907 (gage height, 14.9 feet); minimum, 10 second-feet Aug. 20, 1919 (gage height, 1.50 feet).

REMARKS.—Records good. Discharge estimated July 13–18 and 24–31. Observations discontinued Oct. 20 to Nov. 27, Dec. 2 to Mar. 4, Aug. 1–17, and Sept. 2–30. Numerous diversions from tributary. Storage in several reservoirs on tributaries partly controls flow.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	298		303		636	1,810	2,290	882		192
2	298				609	1,700	3,380	834		
3	298				616	1,590	4,380	720		
4	293				636	1,700	4,120	662		
5	298			1,640	564	1,760	3,460	629		
6	360			1,640	373	1,540	3,000	629		
7	381			1,480	359	1,380	2,850	698		
8	386			1,480	359	1,330	2,780	850		
9	408			1,480	359	1,380	2,850	810		
10	506			1,480	345	1,480	2,850	539		
11	748			1,480	345	1,480	2,920	486		
12	898			1,480	340	1,640	3,080	452		
13	852			1,480	459	2,220	2,920	430		
14	822			1,430	388	2,850	2,780	447		
15	800			1,430	419	3,150	2,560	444		
16	748			1,430	486	2,780	2,560	442		
17	720			1,430	677	2,560	2,420	440		
18	785			1,380	772	2,560	2,160	438	186	
19	913			1,380	706	2,560	1,920	436	171	
20				980	677	2,780	1,700	409	171	
21				866	772	3,080	1,590	378	168	
22				858	818	3,460	1,380	363	174	
23				720	1,000	3,780	1,330	359	176	
24				677	1,190	4,040	1,280		174	
25				655	1,060	4,200	1,200		176	
26				590	990	3,950	1,100		176	
27				552	1,130	3,150	1,060	275	178	
28		354		684	1,480	2,780	1,030		181	
29		288		980	1,700	2,420	962		184	
30		259		944	1,920	2,160	917		192	
31				713		2,160			194	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October 1–19	913	293	569	21,400
March 5–31	1,640	552	1,160	62,100
April	1,920	340	736	43,800
May	4,200	1,330	2,430	149,000
June	4,380	917	2,290	136,000
July	882	275	484	29,700
August 18–31	194	168	179	4,970

Digitized by Google

MARIAS RIVER NEAR BRINKMAN, MONT.

LOCATION.—Wire gage in NW. ¼ sec. 21, T. 29 N., R. 8 E., at Brinkman ranch, 4 miles southwest of Brinkman post office.

RECORDS AVAILABLE.—October, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 4,880 second-feet June 3 (gage height, 4.78 feet); minimum, 139 second-feet Aug. 26 (gage height, 0.70 foot).

1921–1929: Maximum discharge, 14,300 second-feet June 1, 1927 (gage height, 9.2 feet); minimum, 106 second-feet Aug. 26–29, 1926 (gage height, 0.68 foot).

Maximum stage known 18.0 feet, from high-water marks, during flood of 1908 (discharge not determined).

REMARKS.—Records good except those for Dec. 1 to Mar. 25, which are estimated. Numerous diversions from tributaries. Storage in several reservoirs on tributaries.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	385	570					742	1,820	2,330	990	262	155
2	378	610					742	1,820	2,610	990	262	155
3	372	570					695	1,700	4,360	945	262	164
4	372	530					695	1,590	4,360	902	262	164
5	372	530					610	1,590	3,710	818	352	155
6	359	530				250	570	1,700	3,100	734	376	164
7	359	492					455	1,590	2,660	692	294	168
8	372	455					413	1,390	2,660	692	257	172
9	385	455					378	1,340	2,660	775	241	180
10	399	455					413	1,290	2,800	860	241	189
11	413	455					455	1,490	2,800	902	226	194
12	530	455					455	1,590	2,800	775	208	189
13	840	455					448	1,590	2,800	692	246	189
14	890	455					492	2,200	2,660	692	189	189
15	890	455			200		492	2,900	2,660	651	180	189
16	890	492	300	250		500	570	3,050	2,520	651	168	180
17	890	455					695	2,610	2,520	610	160	180
18	890	455					890	2,470	2,380	571	155	176
19	890	455					990	2,470	2,120	532	147	180
20	890	434					990	2,610	1,870	496	151	172
21	940	530					990	2,750	1,750	996	147	172
22	940	610					990	2,900	1,530	427	151	180
23	840	610				2,000	1,040	3,350	1,420	394	147	189
24	840	570					1,090	3,660	1,320	388	147	194
25	742	492					1,140	3,820	1,320	364	147	180
26	742	492				1,190	1,290	3,820	1,270	339	139	172
27	695	492				742	1,190	3,500	1,220	288	160	180
28	695	455				790	1,140	3,050	1,120	294	155	185
29	652	492			-------	652	1,390	2,610	1,080	283	155	189
30	610	530			-------	840	1,700	2,330	1,040	272	164	189
31	610	-------			-------	840	-------	2,330	-------	267	164	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	990	359	651	40,000
November	610	434	501	29,900
December	-------	-------	300	18,400
January	-------	-------	250	15,400
February	-------	-------	200	11,100
March	-------	-------	728	44,800
April	1,700	378	805	47,900
May	3,820	1,290	2,350	144,000
June	4,360	1,040	2,320	138,000
July	990	267	606	37,300
August	376	139	204	12,500
September	194	155	178	10,600
The year	-------	-------	760	426,000

Digitized by Google

BIRCH CREEK AT SWIFT DAM, NEAR DUPUYER, MONT.

LOCATION.—Staff gage near southwest corner of sec. 23, T. 28 N., R. 10 W., just below Swift Dam and 20 miles west of Dupuyer.

DRAINAGE AREA.—75 square miles.

RECORDS AVAILABLE.—March, 1913, to September, 1926; October, 1927, to September, 1929.

EXTREMES.—Maximum discharge during year, 757 second-feet Aug. 12 (gage height, 3.74 feet); minimum, 8 second-feet Oct. 12 to Mar. 14 and Apr. 27 to May 29 (gage height, 1.76 feet).

1913–1926, 1927–1929: Maximum discharge, 5,275 second-feet June 21, 1916; no flow Oct. 2, 1918, and Jan. 2 and 3, 1920.

REMARKS.—Records good. Two small diversions above station. Flow regulated by gate operations at Swift Dam except when water overflows into spillway. Complete data furnished by Valier-Montana Land & Water Co.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	215	8	8	8	8	8	9	8	9	217	161	68
2	215	8	8	8	8	8	9	8	9	418	158	67
3	215	8	8	8	8	8	9	8	9	418	158	45
4	215	8	8	8	8	8	9	8	9	418	158	34
5	215	8	8	8	8	8	9	8	9	407	158	25
6	168	8	8	8	8	8	9	8	9	350	158	14
7	60	8	8	8	8	8	9	8	9	350	457	10
8	17	8	8	8	8	8	9	8	9	350	705	10
9	17	8	8	8	8	8	9	8	9	350	616	10
10	17	8	8	8	8	8	9	8	9	350	151	10
11	12	8	8	8	8	8	9	8	9	350	210	10
12	8	8	8	8	8	8	9	8	9	358	757	10
13	8	8	8	8	8	8	28	8	10	350	720	10
14	8	8	8	8	8	8	65	8	10	350	703	10
15	8	8	8	8	8	12	65	8	10	350	642	10
16	8	8	8	8	8	17	77	8	10	350	618	10
17	8	8	8	8	8	17	95	8	10	350	450	10
18	8	8	8	8	8	13	121	8	10	368	340	10
19	8	8	8	8	8	9	166	8	10	387	352	10
20	8	8	8	8	8	9	241	8	10	387	486	10
21	8	8	8	8	8	9	280	8	10	387	405	10
22	8	8	8	8	8	9	280	8	10	387	83	10
23	8	8	8	8	8	9	280	8	10	411	77	10
24	8	8	8	8	8	9	192	8	10	431	77	10
25	8	8	8	8	8	9	17	8	10	424	75	10
26	8	8	8	8	8	9	11	8	11	418	68	10
27	8	8	8	8	8	9	8	8	11	411	68	10
28	8	8	8	8	8	9	8	8	10	378	68	10
29	8	8	8	8	------	9	8	8	10	161	68	10
30	8	8	8	8	------	9	8	9	10	161	68	10
31	8	------	8	8	------	9	------	9	------	161	68	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	215	8	49.2	3,030
November	8	8	8.0	476
December	8	8	8.0	492
January	8	8	8.0	422
February	8	8	8.0	444
March	17	8	9.3	572
April	280	8	68.6	4,080
May	9	8	8.1	498
June	11	9	9.7	577
July	431	161	353	21,700
August	757	68	300	18,400
September	68	10	16.4	976
The year	757	8	71.5	51,700

Digitized by Google

BIRCH CREEK NEAR DUPUYER, MONT.

LOCATION.—Staff gage in sec. 28, T. 29 N., R. 8 W., half a mile above B Canal head gates and 12 miles northwest of Dupuyer.

DRAINAGE AREA.—110 square miles.

RECORDS AVAILABLE.—July, 1907, to September, 1926; October, 1927, to September, 1929.

EXTREMES.—Maximum discharge during year, 817 second-feet Aug. 13 (gage height, 2.56 feet); minimum, less than 10 second-feet during December.

1907–1926, 1927–1929: Maximum discharge (estimated), 5,000 second-feet June 21, 1916 (gage height, 10. 0 feet); minimum, 3 second-feet Apr. 7, 1921.

REMARKS.—Records good except those for period of ice effect, Nov. 2 to Mar. 14, which are fair. Two or three small diversions above station. Flow largely controlled by gate operations at Swift Dam. Complete records furnished by Valier-Montana Land & Water Co.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	203	23				12	24	66	511	243	184	99
2	210	23				12	24	63	551	437	188	99
3	210	23				12	30	60	437	443	181	99
4	210	22				12	22	58	362	460	178	66
5	210	22				12	14	57	348	466	175	59
6	210	22				13	24	66	414	420	175	26
7	136	21				14	27	96	426	404	290	28
8	60	21				15	23	128	414	393	676	28
9	47	21				16	21	158	426	393	782	28
10	46	20				17	33	161	426	383	251	28
11	46	20				18	20	190	449	383	208	24
12	41	19				19	20	326	404	378	757	24
13	36	19				19	20	426	383	383	800	22
14	34	18				19	20	459	372	383	782	21
15	34	18			11	19	20	351	343	383	700	20
16	33	17	10	11		18	18	312	338	383	669	18
17	31	17				24	20	336	307	383	558	18
18	30	16				24	23	334	262	383	420	18
19	28	16				15	111	383	251	426	404	18
20	26	15				18	173	443	222	426	518	17
21	25	15				15	267	511	215	420	537	17
22	25	14				16	292	594	208	414	258	16
23	25	14				15	307	700	215	414	149	16
24	25	13				16	302	700	201	460	134	16
25	25	13				24	88	601	204	460	123	17
26	25	12				20	87	455	201	449	115	22
27	24	11				25	66	404	191	449	112	20
28	24	10				22	57	357	188	437	104	18
29	24	10			-------	28	76	324	188	208	102	18
30	24	10			-------	29	71	338	181	184	104	17
31	23	-------			-------	31	-------	388	-------	184	104	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	210	23	69.4	4,270
November	23	10	17.2	1,020
December	----------	----------	10	615
January	----------	----------	11	676
February	----------	----------	11	611
March	31	12	18.4	1,130
April	307	14	76.7	4,560
May	700	57	318	19,600
June	551	181	321	19,100
July	466	184	388	23,900
August	800	102	346	21,300
September	99	16	31.2	1,860
The year	800	----------	136	98,600

Digitized by Google

DUPUYER CREEK NEAR VALIER, MONT.

LOCATION.—Water stage recorder in NE. ¼ NW. ¼ sec. 33, T. 29 N., R. 6 W., 1,000 feet above diversion dam at head of D Canal, 6 miles below mouth of Sheep Creek, and 11 miles southwest of Valier.

DRAINAGE AREA.—111 square miles.

RECORDS AVAILABLE.—July, 1912, to September, 1926; October, 1927, to September, 1929.

EXTREMES.—Maximum discharge during year, 170 second-feet June 2 (gage height, 3.70 feet); no flow Sept. 1 and 2.

1912–1926, 1927–1929: Maximum discharge, 2,180 second-feet June 21, 1916 (gage height, 6.5 feet); no flow Sept. 19, 1919, and Sept. 1 and 2, 1929.

REMARKS.—Records good except those for periods of ice effect, which are fair. Several diversions above station. Flow somewhat regulated by operation of head gates above station. Complete records furnished by Valier-Montana Land & Water Co.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30	a 30				a 10	64	102	135	27	5	0
2	31	a 30				a 10	49	95	170	23	6	0
3	31	a 28				a 15	42	93	131	19	7	2
4	31	a 26				a 15	49	97	108	18	8	3
5	31	25				a 15	a 40	86	97	16	9	4
6	31	35				a 15	a 40	80	88	15	9	5
7	31	40				a 20	a 40	76	78	20	9	6
8	30	31				a 20	a 40	75	75	32	8	5
9	30	31				a 35	a 30	78	73	36	7	7
10	31	31				a 40	a 30	86	75	30	7	7
11	a 24	30				a 20	a 30	93	95	28	6	6
12	a 18	30				a 15	a 30	110	83	25	7	5
13	a 30	29				a 20	42	126	70	24	7	5
14	34	29				a 30	50	131	64	22	8	5
15	34	a 25			a 10.0	a 40	56	120	66	19	7	5
16	35	25	a 14	a 11		a 50	59	110	69	18	6	3
17	35	29				a 50	57	116	63	15	6	4
18	40	27				a 50	63	120	60	15	6	5
19	42	a 28				a 42	62	120	56	14	6	5
20	41	31				a 45	66	120	54	13	5	5
21	40	29				a 53	67	126	49	10	5	4
22	37	28				a 55	70	133	45	9	5	4
23	38	28				a 55	81	139	54	8	2	4
24	38	29				a 55	70	142	50	8	2	5
25	37	a 25				a 55	75	133	44	7	1	6
26	36	a 25				64	95	122	43	6	1	13
27	36	a 25				55	104	120	38	5	1	18
28	36	a 25				55	106	124	35	5	1	16
29	35	a 25				a 50	114	108	30	5	1	13
30	34	a 25				a 50	114	100	27	5	1	13
31	33					a 50		97		4	1	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	42	18	33.5	2,060
November	40	25	28.5	1,700
December			14.0	861
January			11.0	676
February			10.0	555
March	64	10	37.2	2,290
April	114	30	61.2	3,640
May	142	75	109	6,700
June	170	27	71.8	4,210
July	36	4	16.2	996
August	9	1	5.2	320
September	18	0	6.1	363
The year	170	0	33.7	24,400

a Stage-discharge relation affected by ice.

Digitized by Google

DRY FORK OF MARIAS RIVER AT FOWLER, MONT.

LOCATION.—Wire gage near center of sec. 31, T. 30 N., R. 1 W., at highway bridge one-fourth mile northeast of depot at Fowler.

RECORDS AVAILABLE.—March, 1920, to September, 1929.

EXTREMES.—Maximum discharge during year, 189 second-feet June 3 (gage height, 1.82 feet); minimum, 2.2 second-feet Nov. 1 and 8 (gage height, 0.28 foot).

1920–1929: Maximum discharge, 1,220 second-feet Apr. 14, 1920 (gage height, 6.20 feet); no flow at times.

REMARKS.—Records good. Observations discontinued Nov. 22 to Mar. 25. Practically all flow diverted and controlled.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.1	2.4	------	44	51	9.4	8.1	34	6.1
2	4.3	3.7	------	32	44	127	8.5	34	6.5
3	4.9	5.2	------	44	46	189	9.0	31	6.1
4	5.8	5.2	------	55	44	104	7.7	189	6.9
5	5.5	4.6	------	40	40	80	7.7	146	7.7
6	4.3	3.1	------	32	46	55	8.5	94	7.3
7	4.6	2.8	------	8.1	48	32	19	34	6.9
8	4.9	2.4	------	8.1	29	26	38	26	6.9
9	6.2	4.6	------	8.1	34	23	34	25	6.1
10	8.0	6.2	------	8.1	31	22	28	25	6.5
11	6.9	5.8	------	8.1	34	44	25	25	6.1
12	6.6	5.5	------	7.7	31	62	23	23	6.1
13	9.8	5.2	------	42	29	80	19	22	5.7
15	12.4	5.2	------	57	35	55	18	19	5.3
14	11.9	4.9	------	84	25	34	13	19	6.1
16	11.1	4.9	------	136	13	20	12.1	19	5.3
17	9.8	4.6	------	127	9.4	40	11.2	18	6.1
18	8.6	5.5	------	100	8.5	28	11.2	19	6.1
19	8.6	6.2	------	110	6.9	17	12.1	16	5.7
20	7.6	9.0	------	127	5.3	15	13.0	17	6.1
21	8.0	4.3	------	100	4.5	8.5	19	13.0	6.1
22	6.6	------	------	94	5.7	8.5	26	11.2	5.7
23	6.9	------	------	86	4.1	10.3	29	8.5	6.5
24	7.2	------	------	86	4.1	9.4	29	7.7	6.9
25	7.6	------	------	79	4.3	10.3	34	8.5	5.3
26	6.9	------	41	80	4.5	10.3	36	6.9	6.9
27	5.8	------	52	100	4.5	9.8	36	7.7	8.5
28	5.2	------	59	94	5.3	10.8	34	7.7	10.3
29	4.9	------	63	77	8.5	10.3	36	7.3	10.3
30	4.0	------	60	55	8.5	7.7	36	6.9	8.5
31	2.5	------	66	------	8.1	------	32	6.9	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	12.4	2.5	6.79	418
November 1–21	9.0	2.4	4.59	191
March 26–31	66	41	56.8	676
April	127	7.7	64.3	3,830
May	51	4.1	21.7	1,330
June	189	7.7	38.6	2,300
July	38	7.7	21.7	1,330
August	189	6.9	29.9	1,840
September	10.3	5.3	6.69	398

Digitized by Google

TETON RIVER NEAR FORT BENTON, MONT.

LOCATION.—Wire gage in SE. ¼ sec. 31, T. 25 N., R., 9 E., at Embleton ranch, 6 miles north of Fort Benton.

RECORDS AVAILABLE.—March to September, 1929.

EXTREMES.—Maximum discharge during period, 668 second-feet June 10 (gage-height, 2.96 feet); no flow Aug. 22 to Sept. 18.

REMARKS.—Records good. Flow regulated by storage and diversions for irrigation.

Daily and monthly discharge, in second-feet, 1929

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1		304	247	146	90	8.0	0
2		264	243	230	85	9.6	0
3		256	234	217	74	10	0
4		243	221	570	68	14	0
5		217	209	482	66	24	0
6		234	201	351	59	24	0
7		168	196	304	59	22	0
8		118	192	260	63	17	0
9		161	176	234	66	13	0
10		188	172	428	68	10	0
11		138	161	328	70	7.5	0
12		153	149	304	66	7.0	0
13		196	146	304	57	6.5	0
14		196	153	304	50	4.5	0
15		247	161	304	53	3.5	0
16		328	165	304	50	2.7	0
17		304	176	282	44	1.9	0
18		304	172	264	39	1.0	0
19		282	161	251	39	1.9	.2
20		256	153	226	39	1.3	3.5
21		247	146	205	38	.1	5.5
22	449	238	146	180	32	0	7.0
23	356	234	146	172	27	0	6.0
24	323	243	165	161	25	0	16
25	251	234	192	153	21	0	15
26	221	238	176	146	15	0	14
27	243	243	188	131	12	0	13
28	256	251	188	115	10	0	16
29	361	260	168	108	8.8	0	21
30	449	251	157	102	9.6	0	29
31	401		146		10	0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March 21-31	449	221	331	6,570
April	328	118	233	13,900
May	247	146	178	10,900
June	570	102	252	15,000
July	90	8.8	45.6	2,800
August	24	0	6.11	376
September	29	0	4.87	290
The period				49,800

Digitized by Google

JUDITH RIVER BASIN

JUDITH RIVER NEAR UTICA, MONT.

LOCATION.—Wire gage in NW. ¼ sec. 17, T. 13 N., R. 12 E., at private wagon bridge on Noel ranch, 10 miles above Utica.

DRAINAGE AREA.—326 square miles.

RECORDS AVAILABLE.—October, 1919, to September, 1929.

EXTREMES.—Maximum discharge during year, 452 second-feet June 1 (gage height, 3.78 feet); minimum, 1.3 second-feet Mar. 10 (gage height, 0.83 foot).

1919–1929: Maximum discharge, 1,070 second-feet June 11, 1927 (gage height, 5.70 feet); minimum, 0.5 second-foot Nov. 16 to Dec. 1, 1919, and Mar. 31 to Apr. 20, 1922 (gage height, 1.00 foot).

REMARKS.—Records good. Observations discontinued Jan. 1 to Mar. 9. Several diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19	19	17	--------	3.8	9.6	366	86	25	13
2	19	19	17	--------	3.6	9.9	423	80	22	14
3	19	19	17	--------	3.8	10	423	78	22	13
4	21	19	17	--------	4.2	11	423	75	22	13
5	21	17	17	--------	4.4	12	394	69	22	13
6	21	17	17	--------	4.0	12	324	72	21	13
7	21	17	17	--------	3.6	12	310	75	22	12
8	21	17	17	--------	3.6	12	310	82	21	12
9	21	17	17	--------	3.6	14	324	75	21	11
10	21	17	17	1.4	4.0	16	324	69	21	12
11	21	17	17	1.5	3.8	18	338	57	20	12
12	22	17	17	1.5	3.6	19	338	49	19	11
13	22	17	17	1.5	4.0	19	338	46	18	11
14	22	17	17	1.5	4.4	37	338	48	17	11
15	22	17	17	1.8	5.5	38	174	41	17	10
16	23	17	17	2.1	5.8	48	174	39	16	10
17	23	17	17	2.3	6.8	55	269	36	15	10
18	22	17	17	2.3	6.8	66	195	36	15	10
19	23	17	17	2.3	7.0	99	174	34	15	10
20	21	17	17	2.3	6.8	118	90	33	15	10
21	21	17	17	2.3	6.5	145	90	32	15	9.3
22	22	17	17	2.3	6.0	184	108	31	14	9.3
23	21	17	17	2.3	6.2	246	118	31	14	8.7
24	21	17	17	2.3	6.2	296	145	29	14	9.0
25	23	17	17	2.5	6.2	296	127	28	14	8.7
26	23	17	17	2.9	6.2	282	118	28	15	8.4
27	21	17	17	6.2	6.0	256	110	28	15	8.1
28	21	17	17	11	6.8	218	102	28	14	8.1
29	20	17	17	4.4	8.4	218	97	27	14	7.8
30	19	17	17	3.8	9.3	184	92	27	13	7.8
31	19	--------	17	3.6	--------	218	--------	26	13	--------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	23	19	21.2	1,300
November	19	17	17.3	1,030
December	17	17	17.0	1,050
March 10–31	11	1.4	2.82	123
April	9.3	3.6	5.36	319
May	296	9.6	103	6,330
June	423	90	239	14,200
July	86	26	48.2	2,960
August	25	13	17.5	1,080
September	14	7.8	10.5	625

Digitized by Google

JUDITH RIVER NEAR WINIFRED, MONT.

LOCATION.—Wire gage near center of sec. 30, T. 21 N., R. 17 E., at the Anderson ranch, 10 miles west of Winifred.

RECORDS AVAILABLE.—May to September, 1929.

EXTREMES.—Maximum discharge during period, about 3,410 second-feet June 2 (gage height, 4.10 feet); minimum, 187 second-feet July 31, Aug. 1, 5, 6, 11, and 12 (gage height, 0.42 foot).

REMARKS.—Records good below 1,200 second-feet and fair above. Numerous diversions above station.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1		998	519	187	213	16	550	918	319	196	260
2		3,410	519	196	213	17	550	838	299	213	250
3		3,300	488	196	222	18	519	1,040	269	204	260
4		1,820	519	196	222	19	550	918	260	204	269
5		2,220	488	187	222	20	519	918	241	196	279
6		1,920	519	187	213	21	550	918	241	204	279
7		1,820	488	196	222	22	550	838	250	196	309
8		1,250	488	213	250	23	616	800	241	196	319
9		1,250	488	204	250	24	686	761	241	196	319
10		1,080	458	196	231	25	918	686	213	204	309
11		1,040	428	187	231	26	1,040	616	213	213	319
12		998	400	187	241	27	1,165	583	213	213	319
13		998	400	196	241	28	1,250	550	196	204	319
14		918	361	204	250	29	1,040	519	204	213	319
15	550	918	330	204	260	30	918	519	196	204	330
						31	998		187	204	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 15–31	1,250	519	763	25,700
June	3,410	519	1,180	70,200
July	519	187	344	21,200
August	213	187	200	12,300
September	330	213	265	15,800
The period				145,000

Digitized by Google

MUSSELSHELL RIVER BASIN

NORTH FORK OF MUSSELSHELL RIVER AT DELPINE, MONT.

LOCATION.—Wire gage in SW. ¼ sec. 35, T. 10 N., R. 9 E., at Delpine.
DRAINAGE AREA.—48 square miles.
RECORDS AVAILABLE.—May, 1909, to October, 1911; March, 1922, to September, 1929.
EXTREMES.—Maximum discharge during year, 76 second-feet Apr. 17 (gage height, 2.34 feet); minimum, 1.2 second-feet Aug. 26 (gage height, 1.33 feet). 1909–1911, 1922–1929: Maximum discharge, about 545 second-feet July 21, 1923 (gage height, 4.5 feet); minimum, that of Aug. 26, 1929.
REMARKS.—Records fair. Stage-discharge relation affected by ice Nov. 1, 20–23, and 28–30. Observations discontinued Dec. 1 to Mar. 23. One small ditch above gage.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.2	8.0	.....	13	27	26	9.5	7.5	2.6
2	6.2	8.5	.....	15	22	26	9.0	8.0	3.0
3	7.0	9.0	.....	4.6	23	25	9.5	8.5	3.8
4	6.6	8.0	.....	38	24	24	9.5	9.0	5.0
5	6.2	8.0	.....	6.2	21	24	8.5	10.0	4.2
6	6.2	9.0	.....	13	21	23	7.5	10.0	5.8
7	6.2	10.0	.....	10.0	19	22	7.5	9.5	6.6
8	6.6	9.5	.....	12	18	22	9.5	9.5	6.2
9	6.6	9.0	.....	5.4	16	24	8.5	9.0	6.2
10	9.0	9.0	.....	5.0	16	24	7.5	9.0	5.8
11	8.0	8.5	.....	4.6	15	25	7.5	8.5	5.0
12	7.0	9.0	.....	5.8	15	24	6.6	8.5	3.8
13	7.0	9.0	.....	9.0	16	24	6.6	8.5	3.2
14	7.0	8.5	.....	14	19	22	7.0	8.0	3.2
15	9.0	8.5	.....	38	17	22	7.0	8.5	3.5
16	7.5	7.5	.....	51	17	19	6.6	7.5	3.5
17	7.0	7.0	.....	76	14	17	7.0	7.0	3.2
18	6.6	7.5	.....	37	15	16	7.0	6.6	3.5
19	6.6	7.5	.....	25	16	14	7.0	6.6	3.5
20	6.6	7.1	.....	46	19	13	6.6	6.6	3.7
21	7.0	6.8	.....	47	18	12	6.6	7.0	4.0
22	7.0	6.6	.....	21	17	12	6.6	5.8	5.6
23	6.6	6.4	.....	17	18	11	6.6	5.8	7.3
24	6.6	6.2	2.8	10	23	10.5	6.6	5.4	7.6
25	6.2	6.6	3.0	19	23	10.5	6.6	2.0	7.3
26	6.2	6.2	2.8	22	29	10.0	6.2	1.2	8.7
27	6.2	7.0	3.0	36	32	9.5	5.8	1.4	8.7
28	5.8	6.8	3.4	24	26	9.5	5.8	1.6	9.0
29	5.8	6.6	4.2	37	27	9.5	5.8	2.0	8.3
30	7.0	6.2	5.4	25	26	9.0	5.8	2.2	7.9
31	8.0	.....	5.0	.....	26	.....	7.0	2.6	.....

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	9.0	5.8	6.82	419
November	10.0	6.2	7.78	463
March 24–31	5.4	2.8	3.70	58.6
April	76	4.6	22.9	1,360
May	32	14	20.5	1,260
June	26	9.0	18.0	1,070
July	9.5	5.8	7.25	446
August	10.0	1.2	6.56	403
September	9.0	2.6	5.32	317

Digitized by Google

MUSSELSHELL RIVER AT HARLOWTON, MONT.

LOCATION.—Chain gage in sec. 26, T. 8 N., R. 15 E., at highway bridge 1 mile south of Harlowton.

DRAINAGE AREA.—1,130 square miles.

RECORDS AVAILABLE.—July, 1907, to September, 1929.

EXTREMES.—Maximum discharge during year, 775 second-feet June 3 (gage height, 4.40 feet); no flow parts of July, August, and September.

1907–1929: Maximum discharge, 4,020 second-feet May 27, 1917 (gage height, 7.3 feet present datum); no flow Aug. 4–11, 1910, Sept. 11–15, 1919, and parts of July, August, and September, 1929.

REMARKS.—Records good. Discharge estimated Nov. 3–6. Observations discontinued Dec. 1 to Mar. 27. Numerous diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	80	-------	82	227	173	78	1.0	0
2	67	86	-------	107	184	600	66	2.2	0
3	80	86	-------	118	169	730	50	1.3	0
4	82	85	-------	124	184	486	50	1.3	0
5	80	85	-------	128	197	384	55	1.0	0
6	78	84	-------	86	176	302	48	.9	0
7	78	84	-------	91	162	275	46	0	0
8	76	86	-------	99	143	265	48	0	0
9	73	86	-------	84	150	302	48	0	0
10	78	91	-------	69	137	302	38	0	0
11	82	91	-------	76	150	286	36	0	0
12	86	82	-------	73	137	297	27	0	0
13	86	89	-------	76	150	286	25	0	0
14	86	89	-------	78	214	251	26	0	0
15	91	91	-------	86	241	236	24	0	0
16	89	82	-------	96	205	222	24	0	0
17	89	82	-------	128	201	256	0	0	0
18	86	69	-------	154	236	241	20	0	0
19	89	56	-------	188	241	214	20	0	0
20	86	91	-------	165	209	193	17	0	.1
21	91	84	-------	180	214	162	14	0	0
22	86	78	-------	193	241	142	8.0	0	.2
23	82	78	-------	197	292	144	4.9	0	.3
24	82	69	-------	197	319	138	3.7	0	.9
25	84	51	-------	162	417	127	1.9	0	2.2
26	84	76	-------	128	450	130	1.6	0	17
27	86	76	-------	134	354	115	1.0	0	23
28	84	71	197	180	292	101	1.0	0	27
29	102	40	137	205	251	85	.9	0	33
30	89	45	107	246	205	92	1.0	0	30
31	91	-------	102	-------	169	-------	.9	0	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	102	65	83.5	5,130
November	91	40	78.1	4,650
March 28–31	197	102	136	1,080
April	246	69	131	7,800
May	450	137	228	13,700
June	730	85	251	14,900
July	78	0	25.3	1,560
August	2.2	0	.25	15.4
September	33	0	4.46	265

Digitized by Google

MUSSELSHELL RIVER AT MUSSELSHELL, MONT.

LOCATION.—Wire gage in NW. ¼ sec. 28, T. 9 N., R. 29 E., at highway bridge at Musselshell, half a mile south of railroad station on Chicago, Milwaukee, St. Paul & Pacific Railroad.

RECORDS AVAILABLE.—August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 882 second-feet June 5 (gage height, 3.76 feet); no flow Sept 1, 3–5, and 8–25.

1928–29: Maximum and minimum discharge, same as given above.

REMARKS.—Records fair. Discharge estimated Oct. 1–6, June 2, and 3. Observations discontinued Nov. 11 to Mar. 13. Numerous diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	100	195	-------	479	300	341	111	3.1	0
2	102	195	-------	504	363	460	94	3.4	.1
3	105	195	-------	262	385	579	72	3.4	0
4	108	211	-------	300	408	698	68	2.1	0
5	111	211	-------	363	363	820	59	2.2	0
6	114	211	-------	455	341	612	55	1.3	.1
7	117	227	-------	455	320	479	52	1.8	.1
8	122	227	-------	341	300	363	40	1.2	0
9	126	227	-------	300	281	363	38	1.4	0
10	128	227	-------	281	262	341	40	1.8	0
11	138	-------	-------	281	244	281	21	1.4	0
12	145	-------	-------	244	244	244	18	1.2	0
13	156	-------	-------	262	244	227	17	1.0	0
14	161	-------	557	227	227	320	17	1.0	0
15	163	-------	385	227	211	557	15	1.0	0
16	166	-------	262	244	227	281	15	.9	0
17	166	-------	385	227	262	311	11	1.6	0
18	180	-------	363	227	281	262	18	1.1	0
19	180	-------	341	262	262	211	15	1.2	0
20	180	-------	320	262	244	262	9.9	.6	0
21	211	-------	320	341	244	244	14	.5	0
22	211	-------	385	363	244	211	5.1	.5	0
23	195	-------	363	385	244	227	8.6	.8	0
24	166	-------	281	363	244	195	5.8	.4	0
25	161	-------	262	363	262	180	2.4	.4	0
26	161	-------	320	363	281	166	3.6	.3	.1
27	166	-------	244	341	281	148	2.5	.3	.5
28	166	-------	262	300	320	145	2.6	.5	.4
29	180	-------	281	281	455	145	2.0	.2	.5
30	180	-------	385	300	431	128	1.4	.2	.4
31	180	-------	698	-------	408	-------	2.4	.1	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	211	100	153	9,410
November 1–10	227	195	213	4,220
March 14–31	698	244	356	12,700
April	504	227	320	19,060
May	455	211	296	18,200
June	820	128	323	19,200
July	111	1.4	27.0	1,660
August	3.4	.1	1.19	73.2
September	.5	0	.07	4.2

Digitized by Google

MUSSELSHELL RIVER AT MOSBY, MONT.

LOCATION.—Wire gage in sec. 3, T. 14 N., R. 30 E., at highway bridge half a mile west of Mosby.
RECORDS AVAILABLE.—May to September, 1929.
EXTREMES.—Maximum discharge during period, about 3,280 second-feet July 19 (gage height, 5.60 feet); no flow Aug. 2, 3, and Aug. 5 to Sept. 30.
REMARKS.—Records for low and medium stages good; others fair. Numerous diversions.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Day	May	June	July	Aug.
1		578	141	0.3	16	345	395	18	0
2		497	138	0	17	345	370	16	0
3		471	116	0	18	345	370	26	0
4		420	79	.3	19	345	345	1,290	0
5		785	71	0	20	345	345	35	0
6		785	58	0	21	345	370	32	0
7		723	62	0	22	321	345	12	0
8		663	66	0	23	321	321	7.6	0
9		550	51	0	24	321	274	4.0	0
10		497	44	0	25	321	251	2.0	0
11		445	41	0	26	321	242	1.8	0
12		445	35	0	27	345	225	1.5	0
13		445	30	0	28	445	208	1.5	0
14		445	26	0	29	550	200	1.2	0
15		445	21	0	30	605	177	.9	0
					31	605		.8	0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 16-31	605	321	389	12,300
June	785	177	421	25,100
July	1,290	.8	78.4	4,820
August	.3	0	.02	1.2
The period				42,200

NOTE.—No flow during September.

Digitized by Google

CHECKERBOARD CREEK AT DELPINE, MONT.

LOCATION.—Staff gage in NE. ¼ sec. 2, T. 9 N., R. 9 E., just below highway bridge one-fourth mile southeast of Delpine and half a mile above junction with North Fork of Musselshell River.

DRAINAGE AREA.—24.3 square miles.

RECORDS AVAILABLE.—March, 1922, to September, 1929. May, 1909, to December 1911, and May, 1913, to December, 1914, at ranch 2 miles upstream.

EXTREMES.—Maximum discharge during year, 21.7 second-feet May 25 (gage height, 1.68 feet); minimum, 1.0 second-foot Dec. 18 and Aug. 24–26.

1909–1911, 1913–14, 1922–1929: Maximum discharge, 167 second-feet July 16, 1923 (gage height, 3.1 feet); minimum, 0.7 second-foot Sept. 10, 1924 (gage height, 0.38 foot).

REMARKS.—Records good. Observations discontinued Dec. 19 to Mar. 23. One small diversion above gage.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.6	5.1	4.4	.....	4.0	9.1	17.9	6.2	3.3	1.7
2	6.0	5.3	4.2	.....	5.1	10.5	17.0	5.7	3.1	1.8
3	6.4	5.3	4.2	.....	4.4	9.4	17.4	5.3	3.1	1.7
4	6.0	5.1	3.7	.....	5.1	10.1	15.6	5.1	3.1	1.8
5	6.0	5.1	3.5	.....	4.9	10.8	14.8	4.9	3.1	1.8
6	5.7	5.1	3.1	.....	10.1	10.5	13.4	4.6	3.1	2.0
7	6.0	4.9	3.5	.....	4.4	7.9	12.3	4.6	2.9	2.1
8	5.7	4.9	2.8	.....	4.2	8.2	10.5	4.4	3.1	2.1
9	5.7	5.1	2.1	.....	4.2	8.2	10.5	4.2	3.1	1.8
10	7.9	5.1	1.8	.....	6.0	8.2	10.5	4.2	2.9	1.8
11	7.0	5.1	1.7	.....	5.5	8.8	10.8	4.2	2.9	2.0
12	6.2	5.1	1.6	.....	5.1	8.8	10.5	4.2	2.9	2.3
13	6.0	5.1	1.4	.....	5.3	9.4	10.5	4.2	2.6	2.3
14	6.0	5.1	1.4	.....	4.4	10.1	10.1	4.2	2.6	2.1
15	6.4	5.1	1.4	.....	4.9	9.8	9.4	4.0	2.3	2.1
16	6.2	4.9	1.3	.....	6.0	8.8	8.8	4.0	1.8	2.1
17	6.0	4.6	1.1	.....	6.4	9.8	8.2	3.8	1.7	2.1
18	6.0	4.9	1.0	.....	6.0	10.5	7.6	3.8	1.7	2.3
19	5.7	5.1	.....	.....	6.0	12.3	7.6	3.7	1.4	2.3
20	5.7	4.6	.....	.....	7.6	13.0	7.3	3.5	1.3	2.4
21	6.0	4.9	.....	.....	10.1	13.9	7.3	3.5	1.3	2.8
22	6.0	4.6	.....	.....	9.4	14.8	7.3	3.5	1.3	2.6
23	5.7	4.6	.....	.....	8.8	16.1	7.0	3.3	1.3	2.4
24	5.7	4.6	.....	3.7	7.6	16.5	7.0	3.3	1.0	2.6
25	5.7	4.6	.....	3.8	7.3	21.7	7.0	3.3	1.0	2.1
26	5.7	4.4	.....	3.8	7.6	19.6	7.3	3.3	1.0	2.0
27	5.5	4.4	.....	4.0	7.9	21.2	6.7	3.3	1.1	2.1
28	5.5	4.2	.....	4.2	9.4	13.9	6.4	3.3	1.1	2.1
29	5.5	4.2	.....	3.8	13.0	13.4	6.2	3.3	1.3	2.0
30	5.3	4.6	.....	4.6	9.8	12.3	6.0	3.3	1.3	2.0
31	5.3	.....	.....	3.7	.....	12.6	.....	3.1	1.5	.....

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	7.9	4.6	5.91	363
November	5.3	4.2	4.86	289
December 1–18	4.4	1.0	2.46	88
March 24–31	4.6	3.7	3.95	63
April	13.0	4.0	6.68	397
May	21.7	7.9	11.9	732
June	17.9	6.0	9.96	593
July	6.2	3.1	4.04	248
August	3.3	1.0	2.10	129
September	2.8	1.7	2.11	126

Digitized by Google

AMERICAN FORK NEAR HARLOWTON, MONT.

LOCATION.—Chain gage in SW. ¼ sec. 12, T. 7 N., R. 15 E., half a mile above junction of American Fork and Lebo Creek and 5 miles southeast of Harlowton.

RECORDS AVAILABLE.—July, 1907, to December, 1911; May to December, 1913; May, 1924, to September, 1929.

EXTREMES.—Maximum discharge during year, 196 second-feet June 2 (gage height, 2.80 feet); no flow parts of July, August, and September.

1907–1911, 1913, 1924–1929: Maximum discharge, 870 second-feet June 1, 1908 (gage height, 4.40 feet); no flow at times.

REMARKS.—Records fair. Observations discontinued Dec. 5 to Mar. 16. No diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.9	5.5	3.9		9.8	4.7	3.5	3.4	0	0
2	3.5	5.1	3.5		11	4.7	196	3.4	0	0
3	3.9	4.3	3.5		11	4.7	111	2.4	0	0
4	4.7	4.3	3.5		9.8	4.7	98	2.3	.2	0
5	5.1	4.3			7.5	4.7	75	2.3	0	0
6	4.7	5.1			5.5	4.7	55	1.8	0	0
7	4.3	5.1			5.5	3.5	37	1.8	0	0
8	4.3	5.5			5.5	3.5	30	1.4	0	0
9	4.3	5.5			5.5	4.3	49	1.3	0	0
10	6.5	5.5			6.0	3.2	45	.8	0	0
11	7.0	5.5			3.5	3.2	51	.4	0	0
12	6.5	5.5			5.5	3.2	45	.3	0	0
13	6.5	5.1			5.1	3.9	47	.2	0	0
14	7.0	5.1			6.0	3.5	49	.3	0	0
15	7.2	4.7			6.0	3.5	51	.4	0	0
16	6.5	4.7			6.5	3.5	55	.2	0	0
17	6.5	4.7		16	8.0	3.5	60	.2	0	0
18	6.0	5.5		11	5.5	3.5	51	.3	0	0
19	6.0	5.5		15	6.0	2.0	51	.2	0	0
20	7.0	6.0		19	6.0	2.0	45	.2	0	0
21	7.0	6.0		11	6.0	1.2	26	.2	0	0
22	7.0	5.5		8.0	6.0	1.2	25	.1	0	0
23	6.5	5.5		8.0	6.5	1.8	24	.2	0	0
24	6.0	5.5		11	5.5	65	19	.2	0	1.2
25	6.0	5.1		8.0	5.1	70	17	.2	0	1.2
26	6.0	4.3		7.0	4.7	70	15	.2	0	2.6
27	5.5	3.9		8.0	4.3	75	14	0	0	2.6
28	5.5	3.9		12	5.3	86	13	0	0	2.6
29	5.5	3.9		8.6	5.5	86	4.7	0	0	2.6
30	6.0	3.9		9.8	6.5	75	4.7	0	0	2.6
31	6.0			8.0		3.5		0	0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	7.2	3.5	5.75	354
November	6.0	3.9	5.00	298
March 17–31	19	7.0	10.7	318
April	11	3.5	63.5	378
May	86	1.2	19.7	1,210
June	196	3.5	45.6	2,710
July	3.4	0	.80	49.2
August	.2	0	.006	.4
September	2.6	0	.51	30.3

Digitized by Google

LEBO CREEK NEAR HARLOWTON, MONT.

LOCATION.—Staff gage in SW. ¼ sec. 12, T. 7 N., R. 15 E., half a mile above junction with American Fork and 5 miles southeast of Harlowton.

DRAINAGE AREA.—48 square miles.

RECORDS AVAILABLE.—July, 1907, to December, 1911; May to November, 1913; May, 1924, to September, 1929.

EXTREMES.—Maximum discharge during year, 46 second-feet Mar. 20–21, and 26 (gage height, 2.62 feet); no flow Dec. 2–4.

1907–1911, 1913, 1924–1929: Maximum discharge, about 417 second-feet July 6, 1928 (gage height, 6.90 feet); no flow at times during 1928 and 1929.

REMARKS.—Records fair. Observations discontinued Dec. 5 to Mar. 19. Numerous diversions and some storage above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	21	4.2	.....	15	21	2.0	1.9	1.2	2.7
2	12	30	0	.....	35	18	2.0	1.9	1.3	2.7
3	16	40	0	.....	35	18	2.4	2.2	1.3	3.4
4	16	40	0	.....	25	18	2.0	2.2	1.3	3.4
5	15	30	.....	.....	25	18	1.9	2.2	1.2	3.0
6	15	21	.....	.....	8.0	21	1.9	1.3	1.2	3.0
7	15	16	.....	.....	25	18	1.9	1.3	1.3	2.7
8	15	12	.....	.....	25	18	1.9	1.3	1.3	3.0
9	15	10	.....	.....	20	18	1.9	1.3	1.3	7.3
10	16	10	.....	.....	22	18	3.0	1.2	1.3	3.4
11	17	16	.....	.....	20	21	3.0	1.1	1.4	3.4
12	16	16	.....	.....	22	18	3.0	1.1	1.4	4.3
13	18	16	.....	.....	24	14	3.0	1.1	1.4	4.3
14	21	18	.....	.....	24	14	3.0	.8	1.4	4.3
15	20	18	.....	.....	22	14	3.0	.8	1.4	4.3
16	18	20	.....	.....	22	9.9	4.3	.8	1.4	4.3
17	16	20	.....	.....	24	7.0	6.3	.8	1.4	4.3
18	16	20	.....	.....	20	7.0	4.3	.8	2.4	4.3
19	16	21	.....	.....	20	7.0	3.5	.8	2.4	4.3
20	16	21	.....	46	20	4.9	3.5	.8	2.4	4.3
21	18	24	.....	46	24	4.9	2.7	.8	2.4	4.5
22	18	21	.....	20	24	9.9	2.4	.8	2.4	4.5
23	16	21	.....	20	24	9.9	3.4	.8	2.5	3.0
24	16	21	.....	20	22	7.0	3.4	2.1	7.0	4.5
25	17	24	.....	26	24	4.9	3.4	1.9	5.8	5.4
26	17	28	.....	46	24	4.9	2.5	2.0	4.0	5.4
27	16	24	.....	43	19	18	2.3	1.2	2.5	6.6
28	16	21	.....	40	22	7.0	2.3	1.2	2.5	7.8
29	16	21	.....	30	22	4.9	2.3	1.2	2.5	7.8
30	16	16	.....	30	22	4.9	2.3	1.2	2.5	6.6
31	16	.....	.....	35	.....	4.9	.....	1.2	2.5	.....

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	21	12	16.2	996
November	40	10	21.2	1,260
March 20–31	46	20	33.5	797
April	35	8.0	22.7	1,350
May	21	4.9	12.4	762
June	6.3	1.9	2.83	168
July	2.2	.8	1.29	79.3
August	7.0	1.2	2.14	132
September	7.8	2.7	4.43	264

Digitized by Google

FLATWILLOW CREEK NEAR FLATWILLOW, MONT.

LOCATION.—Chain gage in NE. ¼ sec. 19, T. 12 N., R. 25 E., on Flatwillow Land & Livestock Co.'s ranch, 12 miles above Flatwillow.

DRAINAGE AREA.—195 square miles.

RECORDS AVAILABLE.—April, 1918, to September, 1929. May, 1911, to April, 1918, at station in sec. 23, T. 12 N., R. 25 E., 4 miles downstream.

EXTREMES.—Maximum discharge during year, 160 second-feet June 4 (gage height, 3.42 feet); minimum, 0.1 second-foot July 20–24, 29, and Aug. 1 (gage height, 0.77 foot).

1911–1929: Maximum discharge, about 954 second-feet at old location June 4–10, 1917 (gage height, estimated, 9.0 feet); no flow at times.

REMARKS.—Records fair. Observations discontinued Oct. 15 to Apr. 30. Several diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	May	June	July	Aug.	Sept.	Day	Oct.	May	June	July	Aug.	Sept.
1	16	64	89	15	0.1	0.9	16	-------	78	42	0.6	6.6	1.6
2	16	64	96	16	.2	.8	17	-------	72	61	.6	7.4	1.8
3	16	64	151	13	.6	.5	18	-------	72	68	.6	7.4	1.8
4	16	72	160	9.8	1.6	1.6	19	-------	72	64	.4	6.6	2.4
5	16	75	143	7.4	1.2	2.8	20	-------	75	68	.1	5.0	4.2
6	16	72	135	3.4	9.0	7.4	21	-------	72	64	.1	3.4	8.2
7	16	64	127	2.0	9.0	8.2	22	-------	75	52	.1	3.4	11
8	18	58	111	1.2	9.8	5.8	23	-------	78	52	.1	2.8	11
9	16	58	103	.9	9.8	3.4	24	-------	75	55	.1	2.4	11
10	16	58	103	.9	4.2	2.4	25	-------	82	55	.2	2.4	11
11	18	64	89	.9	6.6	2.4	26	-------	82	58	.2	2.8	11
12	20	68	78	.9	6.6	2.0	27	-------	103	46	.2	1.2	15
13	20	72	64	.9	6.6	1.2	28	-------	103	40	.2	1.2	15
14	22	78	52	.6	7.4	1.6	29	-------	111	33	.1	1.2	16
15	-------	78	52	.6	6.6	1.6	30	-------	103	24	.4	1.2	16
							31	-------	89	-------	.2	1.2	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October 1–14	22	16	17.3	480
May	111	58	75.8	4,660
June	160	24	77.8	4,630
July	16	.1	2.51	154
August	9.8	.1	4.37	269
September	16	.5	5.99	356

Digitized by Google

FLATWILLOW CREEK AT PETROLIA, MONT.

LOCATION.—Chain gage in NE. ¼ sec. 25, T. 14 N., R. 28 E., 2 miles above junction with Box Elder Creek, 1 mile south of Petrolia, and 16 miles southeast of Winnett, the nearest railway point.

DRAINAGE AREA.—650 square miles.

RECORDS AVAILABLE.—June, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 414 second-feet Mar. 29 (gage height, 4.00 feet); no flow July 19 to Sept. 30.

1921–1929: Maximum discharge (estimated), 3,700 second-feet July 5, 1923 (gage height, 12.94 feet); no flow at times.

REMARKS.—Records fair. Observations discontinued Nov. 29 to Mar. 9. Numerous diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Mar.	Apr.	May	June	July
1	7.5	18	--------	54	46	145	35
2	7.5	18	--------	40	44	114	33
3	7.5	6.5	--------	36	58	100	33
4	9.5	16	--------	42	63	129	28
5	12	18	--------	32	65	129	20
6	12	18	--------	31	64	137	20
7	12	20	--------	31	64	129	20
8	12	20	--------	31	64	129	19
9	12	14	--------	31	64	114	15
10	12	14	327	31	62	100	15
11	12	12	178	27	56	100	14
12	14	12	129	27	56	87	1.3
13	14	12	153	26	54	70	1.1
14	14	14	153	26	54	75	5.0
15	16	14	114	24	54	75	5.0
16	18	14	81	21	49	75	9.0
17	18	12	178	18	51	75	5.0
18	18	12	286	20	55	64	1.1
19	18	10	145	24	55	70	0
20	18	10	114	26	55	75	0
21	18	9.5	87	34	48	70	0
22	18	8.5	64	61	48	64	0
23	18	7.5	54	61	46	70	0
24	18	7.5	42	52	50	49	0
25	18	9.5	94	50	56	57	0
26	18	8.5	122	52	64	57	0
27	16	8.5	122	50	75	57	0
28	16	9.5	122	46	87	55	0
29	16	--------	414	46	114	53	0
30	16	--------	114	46	114	45	0
31	16	--------	42	--------	81	--------	0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	18	7.5	14.6	898
November 1–28	20	6.5	12.6	700
March 10–31	414	42	142	6,200
April	61	18	36.5	2,170
May	114	44	61.8	3,800
June	145	45	85.6	5,090
July	35	0	9.02	555

NOTE.—No flow during August and September.

Digitized by Google

MILK RIVER BASIN

SOUTH FORK OF MILK RIVER NEAR INTERNATIONAL BOUNDARY

LOCATION.—Water-stage recorder in NW. ¼ sec. 29, T. 37 N., R. 9 W., just above Kennedy Coulee, 5 miles south of international boundary, and 30 miles northeast of Browning, Mont.

DRAINAGE AREA.—288 square miles.

RECORDS AVAILABLE.—April, 1905, to September, 1929.

EXTREMES.—Maximum discharge during year, 597 second-feet June 3 (gage height, 3.77 feet); minimum, 0.8 second-foot Sept. 2 (gage height, 1.58 feet).

1905–1929: Maximum stage, from high-water mark, 15.4 feet June 6, 1908 (discharge not determined); no flow Aug. 1–8 and Aug. 18 to Sept. 2, 1919.

REMARKS.—Records good. Discharge estimated Apr. 1–4. Observations discontinued Nov. 1 to Mar. 31. No diversions. Station maintained jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Apr.	May	June	July	Aug.	Sept.
1	36.8	120	237	124	42.4	17.0	1.4
2	37.6	130	229	491	38.5	17.0	1.2
3	38.4	120	217	548	37.2	19.0	1.4
4	44.2	147	205	409	33.3	17.0	2.8
5	48.4	163	194	313	34.6	14.0	5.2
6	49.8	144	160	243	42.4	12.0	6.0
7	54	139	144	188	73	12.0	6.0
8	60	135	135	148	188	12.0	5.2
9	64	130	135	163	144	11.0	5.2
10	72	128	148	208	87	11.0	5.2
11	191	124	243	234	64	11.0	6.0
12	194	122	243	232	55	12.0	5.2
13	143	119	226	234	46.4	11.0	5.2
14	95	135	243	220	43.7	12.0	5.2
15	110	185	234	194	35.9	13.0	6.8
16	146	246	237	171	33.3	14.0	9.2
17	149	270	211	166	30.8	14.0	11.0
18	146	302	185	133	28.4	13.0	11.0
19	115	234	158	89	29.6	13.0	12.0
20	91	220	148	66	26.0	14.0	11.0
21	78	197	148	64	21.2	13.0	11.0
22	60	208	151	62	20.0	12.0	10.0
23	49.8	191	151	76	20.0	10.0	11.0
24	44.2	139	148	95	19.0	10.0	12.0
25	36.8	182	142	84	17.0	7.6	17.0
26	39.2	284	130	73	15.0	7.6	20.0
27	38.4	409	119	66	14.0	6.8	22.4
28	36.0	396	117	58	16.0	4.4	22.4
29	35.2	371	117	52	17.0	1.8	21.2
30	34.4	291	113	43.6	18.0	1.4	19.0
31	24.3	-------	99	-------	17.0	1.4	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	194	24.3	76.2	4,690
April	409	119	199	11,800
May	243	99	173	10,600
June	548	43.6	175	10,400
July	188	14.0	42.2	2,590
August	19.0	1.4	11.1	682
September	22.4	1.2	9.61	572

Digitized by Google

MILK RIVER AT MILK RIVER, ALBERTA

LOCATION.—Water-stage recorder in SE. ¼ sec. 28, T. 2 N., R. 16 W. fourth meridian, at Milk River, Alberta.

DRAINAGE AREA.—1,104 square miles.

RECORDS AVAILABLE.—Open-water seasons July, 1909, to December, 1911; complete records January, 1912, to September, 1929. Prior to October, 1920, maintained by Department of the Interior, Canada.

EXTREMES.—Maximum discharge during year, 1,960 second-feet June 3 (gage height, 4.98 feet); minimum (estimated), 25.1 second-feet Jan. 31.

1909–1929: Maximum discharge (estimated), 7,460 second-feet May 22, 1927 (gage height, 11.41 feet); no flow at times during 1922, 1923, and 1927.

REMARKS.—Records good except those for periods of ice effect, Oct. 29 to Mar. 29 and Apr. 5-10, which are fair. Flow increased by water from St. Mary Canal during irrigation season. Station maintained jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	110	103	70	55	26.2	27.3	459	840	493	488	509	387
2	110	103	66	55	26.2	28.4	495	758	1,660	483	498	364
3	110	108	62	55	26.2	30.6	444	719	1,920	483	498	369
4	114	154	62	55	27.3	32.8	525	665	1,630	477	498	374
5	114	180	62	55	28.4	35.0	154	630	1,300	488	498	369
6	116	195	62	55	29.5	37.6	170	580	1,040	493	504	369
7	116	170	62	55	30.6	116	185	467	898	552	509	369
8	124	170	62	55	31.7	144	200	403	810	746	504	364
9	124	195	62	55	32.8	121	220	384	758	827	504	369
10	126	173	61	55	32.8	147	240	412	752	781	498	374
11	138	154	61	54	38.9	298	264	408	922	735	493	364
12	128	187	61	52	52	298	419	563	1,060	677	483	364
13	157	154	61	51	54	243	505	477	851	619	477	364
14	173	134	61	49.4	59	226	444	467	711	602	472	360
15	198	110	59	48.0	64	284	617	558	525	591	467	374
16	226	102	59	45.4	36.3	422	943	462	422	569	467	360
17	289	97	59	44.1	31.7	411	1,000	493	432	558	462	356
18	308	81	59	41.5	26.2	400	882	437	417	558	462	356
19	279	86	59	40.2	26.2	384	719	388	393	558	462	317
20	238	90	58	37.6	26.2	566	617	346	467	552	462	263
21	202	90	58	36.3	28.4	549	597	327	452	547	452	248
22	184	88	58	33.9	31.7	390	540	323	462	547	442	240
23	173	88	58	32.8	54	400	617	314	493	542	442	237
24	160	86	58	31.7	62	509	566	306	536	536	447	233
25	160	86	56	30.6	48.0	578	546	288	580	530	447	244
26	151	84	56	30.6	41.5	682	654	276	552	530	452	244
27	147	82	56	29.5	33.9	752	876	260	525	525	450	244
28	138	81	56	28.4	26.2	1,720	1,000	248	509	520	440	248
29	138	77	56	27.3	.....	1,230	961	248	509	525	406	240
30	116	74	56	26.2	.....	1,050	980	318	498	520	401	222
31	114	.....	55	25.1	.....	757	.....	408	.....	514	397	.....

Month	Maximum	Minimum	Mean	Run-off in acre feet
October	308	110	161	9,900
November	195	74	119	7,080
December	70	55	59.7	3,670
January	55	25.1	43.4	2,670
February	64	26.2	36.9	2,050
March	1,720	27.3	415	25,500
April	1,000	154	561	33,400
May	840	248	444	27,300
June	1,920	393	753	44,800
July	827	477	570	35,000
August	509	397	468	28,800
September	387	222	320	19,000
The year	1,920	25.1	330	239,000

Digitized by Google

MILK RIVER AT EASTERN CROSSING OF INTERNATIONAL BOUNDARY

LOCATION.—Water-stage recorder in NE. ¼ sec. 6, T. 37 N., R. 9 E., at eastern crossing of international boundary, 30 miles north of Rudyard, Mont., and 37 miles south of Many Berries, Alberta. Zero of gage is 2,698.92 feet above mean sea level.

DRAINAGE AREA.—2,514 square miles.

RECORDS AVAILABLE.—April, 1913, to September, 1929. From August, 1909, to November, 1912, maintained by Irrigation Branch, Department of the Interior, Canada.

EXTREMES.—Maximum discharge during year, 3,050 second-feet June 3 (gage height, 4.42 feet); minimum (estimated), 30 second-feet Mar. 1 and 2.

1909–1929: Maximum discharge, about 12,000 second-feet May 23, 1927 (gage height, 10.16 feet); no flow Aug. 3–17, 22, 23, 1914, Feb. 1 to Mar. 13, 1922, and Mar. 1–5, 1923.

REMARKS.—Records good except those for estimated periods, which are fair. Observations discontinued Nov. 1 to Feb. 28. No diversions. Flow increased by water from St. Mary Canal during irrigation season. Station maintained jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	91	*30	968	1,320	380	518	422	380
2	93	*30	672	1,150	687	496	422	380
3	97	*35	573	968	1,800	462	417	389
4	95	*50	600	916	2,720	437	417	376
5	89	*65	649	916	2,190	437	417	362
6	89		398	783	1,470	417	422	366
7	84		186	726	*1,300	*445	422	366
8	86	*85	245	695	1,140	474	417	366
9	86		209	672	*1,040	484	422	362
10	93		217	840	942	573	422	350
11	97	*102	226	865	916	758	422	358
12	97	*142	457	641	899	656	422	358
13	102	*255	398	634	1,160	561	427	358
14	118	*270	490	718	1,150	490	417	354
15	120	*280	656	799	849	490	417	346
16	113	*380	672	710	783	484	412	329
17	182	*516	1,020	672	*680	474	412	325
18	199	*658	1,260	621	580	468	407	325
19	217	*931	1,130	600	664	468	407	321
20	293	*783	968	607	536	479	422	317
21	270	*652	882	536	484	484	442	314
22	244	*707	824	496	501	484	427	242
23	196	*722	799	474	496	484	457	226
24	179	*607	783	462	*516	474	432	212
25	160	*492	807	457	536	468	412	217
26	144	*422	708	437	649	474	412	215
27	140	*397	607	407	627	442	417	215
28	125	468	775	389	600	412	417	220
29	*125	783	1,090	376	580	417	412	217
30	125	1,820	1,310	380	567	407	407	220
31	*125	1,640	-------	384	-------	422	398	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	293	84	138	8,480
March	1,820	30	441	27,100
April	1,310	186	686	40,800
May	1,320	376	666	41,000
June	2,720	380	915	54,400
July	758	407	485	29,800
August	457	398	419	25,800
September	389	212	313	18,600

* Estimated because of ice or missing gage height.

Digitized by Google

MILK RIVER ABOVE HAVRE, MONT.

LOCATION.—Water-stage recorder in SW. ¼ sec. 32, T. 33 N., R. 15 E., one-fourth mile above mouth of Big Sandy Creek and 6 miles west of Havre.

RECORDS AVAILABLE.—May, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 2,380 second-feet June 5 (gage height, 5.72 feet); minimum, 79 second-feet Oct. 8 (gage height, 2.60 feet). 1928–29: Maximum discharge, 2,540 second-feet June 21, 1928 (gage height, 5.42 feet); minimum, that of Oct. 8, 1928.

REMARKS.—Records fair. Discharge estimated Oct. 28–31, Apr. 6–14, May 10 and 11. Observations discontinued Nov. 1 to Mar. 19. No diversions. Flow increased by discharge of St. Mary Canal during irrigation season.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	87	----	1,470	1,430	362	550	378	419
2	87	----	1,280	1,430	396	527	388	410
3	89	----	1,100	1,360	494	468	388	396
4	85	----	1,000	1,240	1,670	444	388	401
5	82	----	1,000	1,100	2,210	419	392	406
6	85	----	750	1,100	1,960	429	392	392
7	82	----	750	990	1,810	510	406	368
8	82	----	600	890	1,640	544	406	374
9	82	----	400	820	1,390	550	392	378
10	85	----	220	810	1,200	578	406	383
11	90	----	250	800	1,100	666	414	370
12	89	----	350	790	1,040	609	410	388
13	84	----	480	790	1,000	544	406	370
14	90	----	600	733	990	468	406	345
15	97	----	693	782	1,010	439	410	314
16	109	----	830	798	956	424	419	333
17	112	----	830	740	922	429	410	329
18	116	----	1,040	686	890	439	401	278
19	123	----	1,240	692	850	444	406	306
20	150	1,040	1,180	621	782	424	414	310
21	168	1,070	1,140	609	640	419	401	310
22	228	1,000	1,040	532	521	453	419	314
23	260	1,000	1,000	538	468	439	419	288
24	238	965	930	489	473	429	410	278
25	231	965	862	453	479	424	424	257
26	208	965	771	429	484	424	414	257
27	186	895	688	468	516	429	410	247
28	165	753	670	453	555	406	401	234
29	145	798	895	406	597	410	406	234
30	140	886	1,320	396	571	388	410	228
31	130	1,470	----	396	----	370	434	----

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	260	82	129	7,930
March 20–31	1,470	753	984	23,400
April	1,470	220	844	50,200
May	1,430	396	767	47,200
June	2,210	362	933	55,500
July	666	370	468	28,800
August	434	378	406	25,000
September	419	228	331	19,700

Digitized by Google

MILK RIVER NEAR VANDALIA, MONT.

LOCATION.—Staff gage in NE. ¼ sec. 7, T. 30 N., R. 37 E., just below Putnam Dam and 2 miles west of Vandalia.

RECORDS AVAILABLE.—May, 1915, to September, 1920; April to September, 1929.

EXTREMES.—Maximum discharge during year, 2,540 second-feet June 10 (gage height, 12.3 feet); no flow, gates in dam closed, Sept. 4 and 8–16.

1915–1920, 1929: Maximum discharge, 25,200 second-feet Apr. 11, 1917 (gage height, 34.5 feet); no flow Aug. 9–13, 1910, June 5, 1919, and Sept. 4 and 8–16, 1929.

REMARKS.—Records good. Numerous diversions from main stream and tributaries upstream. Vandalia Canal diverts at dam above gage. Some regulation at dam and some storage in Nelson Reservoir.

Daily and monthly discharge, in second-feet, 1928–29

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	-------	2,050	760	540	139	61	16	-------	1,230	1,230	180	61	0
2	-------	1,730	1,090	432	95	61	17	-------	1,230	1,520	139	61	22
3	-------	1,460	930	405	95	22	18	-------	1,230	1,610	95	61	95
4	-------	1,440	615	405	95	0	19	-------	1,230	2,080	95	61	105
5	-------	1,670	665	300	77	1,010	20	-------	1,230	1,730	95	61	139
6	-------	2,030	715	300	77	405	21	-------	1,230	1,550	127	61	166
7	-------	2,360	970	300	77	61	22	-------	1,230	1,260	166	61	180
8	-------	2,210	1,780	300	77	0	23	665	890	1,440	139	61	193
9	-------	1,870	2,260	193	77	0	24	1,120	850	1,520	115	61	193
10	-------	1,700	2,480	180	77	0	25	1,400	850	1,090	139	61	193
11	-------	1,440	2,440	139	61	0	26	1,630	760	1,050	166	61	193
12	-------	1,160	2,410	115	61	0	27	1,700	665	1,010	95	61	193
13	-------	970	2,210	115	61	0	28	1,700	540	760	95	61	223
14	-------	970	1,890	115	61	0	29	1,780	515	760	95	61	223
15	-------	1,440	1,730	166	61	0	30	2,000	460	805	95	61	223
							31	-------	515	-------	193	61	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 28–30	2,000	665	1,500	23,800
May	2,360	460	1,260	77,500
June	2,480	615	1,410	83,900
July	540	95	195	12,000
August	139	61	69.9	4,300
September	1,010	0	132	7,860
The period				209,000

Digitized by Google

NORTH FORK OF MILK RIVER ABOVE ST. MARY CANAL, NEAR BROWNING, MONT.

LOCATION.—Water-stage recorder in SW. ¼ sec. 16, T. 37 N., R. 11 W., 1¼ miles above outlet of canal, 3 miles south of international boundary, and 30 miles north of Browning.

DRAINAGE AREA.—62 square miles.

RECORDS AVAILABLE.—June, 1921, to September, 1929. Records obtained only during period when St. Mary Canal is in operation.

EXTREMES.—Maximum discharge during year, 142 second-feet June 2 (gage height, 2.45 feet); minimum, 18.4 second-feet Aug. 16 (gage height, 0.69 foot).

1921–1929: Maximum discharge, 363 second-feet May 29, 1927 (gage height, 4.93 feet); minimum, 7.3 second-feet Sept. 22, 1922.

REMARKS.—Records good. Discharge estimated May 6 and Sept. 17–19. No diversions or regulation. Station maintained jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	64	52	27.3	21.7	19.8	16	------	64	34.9	23.3	18.4	21.3
2	------	57	95	26.4	21.3	20.9	17	------	58	33.7	22.5	18.7	21.3
3	------	50	67	25.5	21.7	22.9	18	------	54	33.2	22.9	19.0	21.3
4	------	50	54	25.5	21.7	21.7	19	------	54	32.7	22.9	19.0	21.7
5	------	50	46.6	25.9	21.7	21.7	20	------	54	31.7	21.7	19.0	21.7
6	------	48.0	43.0	34.3	21.7	22.1	21	------	52	31.2	21.3	19.4	22.1
7	------	45.9	40.7	45.3	20.9	21.7	22	------	50	33.7	22.1	19.4	21.7
8	------	46.6	38.9	38.3	20.9	21.7	23	------	49.1	36.0	21.7	19.8	22.9
9	------	54	44.1	31.2	20.1	22.1	24	------	47.2	33.2	21.7	19.8	22.9
10	------	62	65	28.7	20.1	22.5	25	------	43.6	30.7	21.7	19.8	23.7
11	------	67	62	26.9	19.8	22.1	26	------	40.7	29.7	21.7	19.8	23.3
12	------	60	50	26.9	19.8	21.7	27	------	40.1	28.7	21.7	19.8	23.7
13	------	62	44.7	25.9	19.8	21.7	28	70	39.5	28.2	21.7	19.4	22.9
14	------	63	40.7	25.0	19.4	21.3	29	64	37.8	28.2	21.7	19.0	22.9
15	------	58	36.6	24.1	19.4	21.7	30	64	36.6	27.8	21.3	19.4	22.5
							31	------	37.8	------	21.3	19.4	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 28–30	70.0	64.0	66.0	393
May	67.0	36.6	51.5	3,170
June	95.0	27.8	41.8	2,490
July	45.3	21.3	25.4	1,560
August	21.7	18.4	20.0	1,230
September	23.7	19.8	22.0	1,310
The period	------	------	------	10,200

Digitized by Google

NORTH FORK OF MILK RIVER NEAR INTERNATIONAL BOUNDARY

LOCATION.—Water-stage recorder in NE. ¼ sec. 11, T. 1, R. 23 W. fourth meridian, 300 yards above highway bridge at Peters ranch, 2 miles north of international boundary, and 18 miles east of Kimball, Alberta.

DRAINAGE AREA—101 square miles.

RECORDS AVAILABLE—January, 1913, to September, 1929. July, 1909, to December, 1912, maintained by Irrigation Branch of the Department of the Interior, Canada, in NE. ¼ sec. 13, 2 miles downstream. May, 1911, to December, 1912, at Alexander Dubray ranch, 2 miles south of international boundary.

EXTREMES.—Maximum discharge during year, 727 second-feet June 2 (gage height, 3.32 feet); minimum, about 12.2 second-feet Mar. 1.

1909–1929: Maximum discharge, 1,070 second-feet May 8, 1920 (gage height, 4.14 feet); minimum, 3.2 second-feet Mar. 1, 1927.

REMARKS.—Records good except those for period of ice effect, Mar. 1 to Apr. 17, which are fair. Observations discontinued Nov. 1 to Feb. 28. No diversions. Flow increased by discharge of St. Mary Canal during irrigation season. Station maintained jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	43.0	12.2	58	214	346	441	477	394
2	44.5	13.4	58	210	645	446	472	389
3	44.5	14.6	75	178	579	456	472	389
4	44.5	15.8	77	169	492	461	472	380
5	43.0	17.0	30.4	156	422	461	466	367
6	43.0	17.7	53	106	446	487	472	350
7	43.0	19.8	59	89	451	600	466	358
8	43.0	22.6	58	87	451	574	466	354
9	44.5	27.2	45.4	96	461	512	466	354
10	50	28.8	39.2	102	456	512	466	350
11	47.5	27.2	43.2	121	456	507	472	350
12	67	28.0	46.5	110	446	507	472	341
13	79	32.0	58	106	436	507	472	341
14	62	41.0	66	121	333	507	466	341
15	77	60	162	121	242	502	472	341
16	84	60	196	117	224	502	482	341
17	79	59	95	110	214	497	487	341
18	64	58	74	95	242	497	487	296
19	54	56	72	93	354	492	487	231
20	50	56	74	91	358	487	487	220
21	49.0	55	74	87	358	487	477	217
22	47.5	55	91	84	358	482	477	214
23	46.0	55	75	80	403	482	466	207
24	44.5	55	77	79	446	482	466	210
25	46.0	55	77	75	446	482	466	217
26	49.0	52	124	67	436	487	466	224
27	50	48.7	135	67	436	477	461	224
28	47.5	66	147	68	446	472	436	217
29	50	55	164	197	451	477	427	194
30	49.0	58	184	238	446	477	427	156
31	45.0	60	------	284	------	477	417	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	84	43.0	52.6	3,230
March	66	12.2	41.3	2,540
April	196	30.4	86.2	5,130
May	284	67	123	7,560
June	645	214	409	24,300
July	600	441	492	30,300
August	487	417	467	28,700
September	394	156	297	17,700

Digitized by Google

BIG SANDY CREEK NEAR BOXELDER, MONT.

LOCATION.—Staff gage in NE. ¼ sec. 13, T. 30 N., R. 13 E., at Cowan ranch, 3 miles north of Boxelder.

RECORDS AVAILABLE.—March, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 206 second-feet June 8 (gage height, 8.59 feet); no flow March 17 (gates closed at dam).

1928–29: Maximum discharge, 338 second-feet Mar. 25, 1928 (gage height, 10.96 feet); no flow Mar. 17 1929 (gates closed at dam).

REMARKS.—Records good. Observations discontinued Dec. 16 to Mar. 9. Flow regulated by storage in Cowan Reservoir. Small diversion for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.5	3.6	3.5	-------	63	34	52	52	3.7	1.1
2	3.5	3.6	3.5	-------	52	30	56	6.0	3.3	1.0
3	3.5	3.6	3.5	-------	49	31	66	4.5	3.2	1.1
4	3.5	3.6	3.5	-------	63	31	94	5.2	4.0	1.2
5	3.5	27	3.5	-------	70	46	130	10	4.0	1.1
6	3.5	38	3.5	-------	49	63	126	9.5	3.5	1.0
7	3.5	33	3.5	-------	46	38	146	6.8	3.5	1.0
8	3.5	16	3.5	-------	34	31	202	6.8	3.2	1.0
9	3.5	4.4	3.5	-------	33	38	170	15	3.2	1.0
10	3.5	31	3.5	3.8	30	42	98	24	3.2	1.0
11	3.5	33	3.5	7.7	30	42	84	24	2.7	1.0
12	3.5	10	3.5	16	28	39	130	21	2.5	1.0
13	3.5	4.2	3.5	46	25	46	110	21	2.1	1.0
14	3.5	4.0	3.5	49	20	56	91	18	2.0	1.0
15	3.5	3.8	3.5	2.0	18	110	76	17	2.0	1.0
16	3.5	3.7	-------	2.0	20	98	66	8.6	2.0	1.0
17	42	3.7	-------	0	22	84	34	3.8	2.0	1.0
18	21	3.7	-------	.2	21	52	42	4.5	1.8	1.0
19	4.2	3.7	-------	1.0	6.0	46	63	4.5	1.8	1.0
20	4.0	3.7	-------	6.0	.5	56	76	5.2	2.0	1.0
21	4.0	3.8	-------	14	18	80	80	5.8	1.8	1.0
22	4.0	3.8	-------	14	80	63	84	4.8	1.8	1.0
23	3.8	3.8	-------	49	4.2	42	87	5.2	1.8	1.0
24	3.7	3.7	-------	42	.3	27	87	4.5	1.8	1.2
25	3.7	3.6	-------	39	28	31	87	3.8	1.5	1.0
26	3.7	3.6	-------	42	28	31	87	3.8	1.4	1.0
27	3.7	3.6	-------	39	28	34	76	3.8	1.8	1.0
28	3.7	3.6	-------	42	33	42	73	3.8	1.8	1.0
29	3.7	3.6	-------	59	30	56	63	3.8	1.8	1.0
30	3.7	3.6	-------	84	31	73	158	3.8	1.6	1.0
31	3.7	-------	-------	76	-------	76	-------	3.8	1.2	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	42	3.5	5.44	334
November	38	3.6	9.13	543
December 1–15	3.5	3.5	3.50	104
March 10–31	84	0	28.8	1,260
April	80	.3	32.0	1,900
May	110	27	50.6	3,110
June	202	34	93.1	5,540
July	52	3.8	10.1	621
August	4.0	1.2	2.39	147
September	1.2	1.0	1.02	60.7

Digitized by Google

LODGE CREEK AT INTERNATIONAL BOUNDARY

LOCATION.—Water-stage recorder in SE. ¼ sec. 12, T. 1, R. 29 W., third meridian, 1 mile north of international boundary, in Saskatchewan, Canada, and 30 miles northwest of Havre, Mont.

DRAINAGE AREA.—797 square miles.

RECORDS AVAILABLE.—April, 1917, to September, 1929. April, 1910, to October, 1916, maintained by Irrigation Branch, Department of the Interior, Canada.

EXTREMES.—Maximum discharge during year, 1,080 second-feet May 1 (gage height, 7.10 feet); no flow at times during year.

1917–1929: Maximum discharge, 3,680 second-feet May 23, 1927 (gage height, 12.41 feet); no flow at times.

REMARKS.—Records good except those for period of ice effect, Mar. 1–29, which are fair. Observations discontinued Nov. 1 to Feb. 28. Several diversions above gage. Station maintained jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Daily and monthly discharge, in second-feet, 1928–29

Day	Mar.	Apr.	May	June	July	Day	Mar.	Apr.	May	June	July
1	0	145	889	6.6	0.5	16	0.3	123	49.4	3.2	0
2	0	71	548	9.2	.5	17	.4	202	51	3.4	0
3	0	68	404	10.6	.2	18	.2	249	44.8	3.1	0
4	0	74	292	8.7	0	19	2.6	268	44.8	2.9	0
5	0	121	271	7.9	0	20	3.1	236	40.6	2.7	0
6	0	123	134	6.6	0	21	3.2	218	34.0	2.5	0
7	0	73	107	5.8	0	22	3.3	239	28.6	2.3	0
8	0	64	71	5.4	0	23	3.5	295	27.1	2.1	0
9	0	68	56	5.3	0	24	3.6	334	25.0	1.9	0
10	0	56	51	4.4	0	25	3.9	271	21.4	1.8	0
11	0	36.4	49.4	3.8	0	26	5.4	170	18.7	1.6	0
12	0	31.6	54	3.4	0	27	9.2	113	17.4	1.4	0
13	0	27.8	44.0	2.9	0	28	5.8	88	16.7	1.3	0
14	.1	25.7	49.4	2.8	0	29	106	100	14.8	.9	0
15	.2	30.0	49.4	2.9	0	30	223	308	11.8	.8	0
						31	231	-------	7.9	-------	0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March	231	0	19.5	1,200
April	334	25.7	141	8,390
May	889	7.9	114	7,010
June	10.6	.8	3.94	234
July	.5	0	.04	2.5

NOTE.—No flow during October, August, and September.

McREA COULEE AT INTERNATIONAL BOUNDARY

LOCATION.—Water-stage recorder in NW. ¼ sec. 5, T. 1, R. 28 W., one-fourth mile above mouth and three-fourths mile north of international boundary, in Saskatchewan, Canada.

DRAINAGE AREA.—53 square miles.

RECORDS AVAILABLE.—March, 1927, to September, 1929.

EXTREMES.—Creek dry or at pool stage during entire season.

1927–1929: Maximum discharge, 486 second-feet May 23, 1927 (gage height, 5.74 feet); no flow at times.

REMARKS.—No flow during season of 1929. Observations discontinued during winter. Station maintained jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Digitized by Google

NORTH CHINOOK CANAL NEAR HAVRE, MONT.

LOCATION.—Staff gage in SE. ¼ sec. 2, T. 35 N., R. 17 E., 1 mile below headworks and 23 miles northeast of Havre.

RECORDS AVAILABLE.—May, 1928, to September, 1929.

REMARKS.—Records good except those for Apr. 11–24, which are estimated. This canal diverts flood water from Lodge Creek in sec. 3, T. 35 N., R. 17 E., and stores it in North Chinook Reservoir for irrigation of lands between Lodge Creek and Battle Creek north of Chinook, Mont.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	Day	Apr.	May	June	Day	Apr.	May	June
1		56	9.7	11	25	28	5.8	21	66	24	0.3
2		48	10.4	12		27	6.8	22	66	24	.1
3		48	19.2	13		27	9.8	23	66	22	.1
4		51	21	14		27	6.7	24	66	21	0
5		49	17.6	15		26	4.0	25	67	21	------
6		42	10.9	16		26	2.9	26	63	18.6	------
7		36	9.1	17		26	1.7	27	63	17.2	------
8		34	8.2	18		27	1.3	28	63	19.2	------
9		31	6.3	19		26	1.1	29	53	15.2	------
10		28	5.6	20		26	.4	30	56	13.0	------
								31		13.0	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 11–30	67	25	44.0	1,750
May	56	13.0	28.9	1,780
June 1–24	21	0	6.62	315
The period				3,840

NOTE.—Canal opened Apr. 11; closed June 25.

Digitized by Google

BATTLE CREEK AT INTERNATIONAL BOUNDARY

LOCATION.—Water-stage recorder in SE. ¼ sec. 4, T. 1, R. 26 W. third meridian, in Saskatchewan, Canada, one-fourth mile above point where creek crosses international boundary and 35 miles north of Chinook, Mont.

DRAINAGE AREA.—726 square miles.

RECORDS AVAILABLE.—April, 1917, to September, 1929.

EXTREMES.—Maximum discharge during year, 763 second-feet Apr. 26 (gage height, 5.07 feet); no flow at times during year.

1917–1929: Maximum discharge, 3,200 second-feet Apr. 13, 1917 (gage height, 8.50 feet); no flow at times.

REMARKS.—Records good except those for period of ice effect, Mar. 13 to Apr. 14, which are fair. Observations discontinued Nov. 1 to Feb. 28. Numerous diversions above station. Station maintained jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Mar.	Apr.	May	June	July	Aug.
1	16.3	0	58	258	81	30.8	1.4
2	17.1	0	66	221	81	28.6	.9
3	18.6	0	70	185	88	26.4	.9
4	19.4	0	75	162	104	24.2	.4
5	20.1	0	66	151	101	22.0	.4
6	20.1	0	58	157	104	23.1	.2
7	20.9	0	66	140	91	23.1	.2
8	21.8	0	58	122	81	24.2	.2
9	23.8	0	75	114	72	25.3	0
10	23.8	0	85	109	64	22.0	0
11	23.8	0	95	105	63	20.3	0
12	23.8	0	106	107	57	20.3	0
13	24.7	0	116	112	56	19.4	0
14	27.6	1.0	137	107	53	20.3	0
15	30.4	2.7	107	104	50	17.8	0
16	39.2	6.0	117	107	46.0	15.2	0
17	35.4	7.5	117	110	46.0	13.5	0
18	34.2	63	116	107	44.7	12.4	0
19	34.2	52	121	102	44.7	11.3	0
20	32.9	48.8	177	104	46.0	10.8	0
21	31.7	28.5	177	97	46.0	9.1	0
22	30.4	20.9	193	94	46.0	8.0	0
23	29.4	16.3	275	88	44.7	7.3	0
24	27.6	20.9	470	86	43.4	6.9	0
25	27.6	24.7	656	85	42.1	5.8	0
26	27.6	34.2	592	80	39.5	5.4	0
27	27.6	36.7	258	81	38.2	5.0	0
28	28.5	43.0	233	86	34.3	3.6	0
29	25.6	50	239	81	33.0	3.0	0
30	26.6	43.0	258	77	30.8	2.0	0
31	20.1	36.7	-------	83	-------	1.7	0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	39.2	16.3	26.2	1,610
March	63.0	0	17.3	1,060
April	656	58.0	175	10,400
May	258	77.0	117	7,190
June	104	30.8	59.0	3,510
July	30.8	1.7	15.1	928
August	1.4	0	.15	9.2

NOTE.—No flow during September.

Digitized by Google

WOODPILE COULEE NEAR INTERNATIONAL BOUNDARY

LOCATION.—Water-stage recorder in NW. ¼ sec. 8, T. 37 N., R. 17 E., just below Antelope Coulee, 2 miles east of Phipps, Mont., and 4 miles south of international boundary.

DRAINAGE AREA.—70 square miles.

RECORDS AVAILABLE.—March, 1927, to September, 1929.

EXTREMES.—Maximum discharge during year, 35.8 second-feet June 2 (gage height, 2.14 feet); no flow at times during year.

1927–1929: Maximum discharge, 423 second-feet Apr. 4, 1927 (gage height, 16.69 feet); no flow at times.

REMARKS.—Records good. Observations discontinued Nov. 1 to Feb. 28. No diversions. Station maintained jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Daily and monthly discharge, in second-feet, 1928–29

Day	Apr.	May	June	Day	Apr.	May	June	Day	Apr.	May	June
1	0	5.4	0.1	11	0	0.04		21	0	0	0
2	0	1.1	2.5	12	0	.01		22	0	0	0
3	0	4.8	22.2	13	0	0	0.8	23	0	0	0
4	0	7.4	5.4	14	0	0		24	0	0	0
5	0	1.9	2.0	15	0	0		25	0	0	0
6	0	.4		16	0	0		26	0	0	0
7	0	.2		17	0	0	.2	27	0	0	0
8	0	.1	1.5	18	0	0		28	0	0	0
9	0	.1		19	0	0	.03	29	0	0	0
10	0	.1		20	0	0	0	30	8.4	.1	0
								31		.1	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April	8.4	0	0.280	16.7
May	5.4	0	.702	43.2
June	22.2	0	1.48	88.1

NOTE.—No flow during October, March, July, August, and September.

Digitized by Google

EAST FORK OF BATTLE CREEK NEAR INTERNATIONAL BOUNDARY

LOCATION.—Water-stage recorder in NW. ¼ sec. 17, T. 37 N., R. 20 E., 2 miles south of international boundary and 7 miles east of Norheim, Mont.

DRAINAGE AREA.—98 square miles.

RECORDS AVAILABLE.—March, 1927, to September, 1929.

EXTREMES.—Maximum discharge during year, 79 second-feet Apr. 15 (gage height, 2.39 feet); no flow at times during year.

1927–1929: Maximum discharge, 432 second-feet Apr. 1, 1928 (gage height, 5.48 feet); no flow at times.

REMARKS.—Records good except those for period of ice effect, Mar. 16–31, and for estimated period, Apr. 8–12, which are fair. Observations discontinued Nov. 1 to Feb. 28. No diversions. Station maintained jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Daily and monthly discharge, in second-feet, 1928–29

Day	Mar.	Apr.	May	June	Day	Mar.	Apr.	May	June
1	0	0.9	23.7	1.3	16	0	15.2	0.3	0.01
2	0	.4	6.0	1.9	17	0	6.0	.3	.1
3	0	.3	8.1	19.5	18	.5	3.2	.2	.1
4	0	.3	13.7	18.6	19	.6	1.5	.2	.1
5	0	.4	5.4	4.9	20	.3	.9	.1	.1
6	0	.2	2.0	2.0	21	.2	.7	.1	.02
7	0	.1	.9	1.0	22	.2	.5	.04	.01
8	0	.1	.4	.5	23	.1	.4	.02	.01
9	0	.1	.3	.3	24	.1	.3	.02	.01
10	0	.2	.3	.2	25	.3	.2	.02	0
11	0	.5	.3	.2	26	.3	.2	.01	0
12	0	1.0	.4	.1	27	.3	.2	.2	0
13	0	1.5	.5	.1	28	.3	.1	17.1	0
14	0	13.7	.4	.02	29	.4	.3	14.0	0
15	0	47.2	.4	.01	30	.4	10.1	3.7	0
					31	.8		2.4	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March	0.8	0	0.16	9.8
April	47.2	.1	3.56	212
May	23.7	.01	3.27	201
June	19.5	0	1.70	101

NOTE.—No flow during October, July, August, and September.

Digitized by Google

LYONS COULEE AT INTERNATIONAL BOUNDARY

LOCATION.—Chain gage in NE. ¼ sec. 4, T. 37 N., R. 19 E., half a mile south of international boundary and 1 mile east of Norheim, Mont.

DRAINAGE AREA.—47 square miles.

RECORDS AVAILABLE.—March, 1927, to September, 1929.

EXTREMES.—Maximum discharge during year, 21.3 second-feet June 4 (gage height, 3.68 feet); no flow at times during year.

1927–1929: Maximum discharge, 668 second-feet Apr. 3, 1927 (gage height, 7.65 feet); no flow at times.

REMARKS.—Records good. Observations discontinued Nov. 1 to Feb. 28. Small diversions above gage. Station maintained jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Daily and monthly discharge, in second-feet, 1928–29

Day	May	June	Day	May	June	Day	May	June
1	2.0	0.8	11	0.2	12.9	21	0	0.2
2	2.6	1.4	12	.05	8.3	22	0	.04
3	4.0	5.3	13	.04	5.3	23	0	.04
4	7.9	21.3	14	.03	2.1	24	0	.04
5	4.6	7.3	15	.02	1.6	25	0	.03
6	3.1	5.7	16	.02	.8	26	0	.02
7	1.5	3.1	17	.02	.9	27	0	.01
8	.3	1.9	18	.01	.8	28	0	0
9	2.8	1.3	19	0	.6	29	0	0
10	.6	.8	20	0	.7	30	0	0
						31	.5	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May	7.9	0	0.977	60.1
June	21.3	0	3.01	179

NOTE.—No flow during October, March, April, July, August, and September.

Digitized by Google

MATHESON CANAL NEAR CHINOOK, MONT.

LOCATION.—Staff gage in NW. ¼ sec. 29, T. 33 N., R. 30 E., at head works 3½ miles east of Chinook
RECORDS AVAILABLE.—April, 1905, to October, 1921; May, 1928, to June, 1929.
REMARKS.—Records poor. This canal diverts from right bank of Battle Creek for irrigation of lands between Battle Creek and Milk River.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May
1		4.0
2		3.0
3		2.0
4	3.0	.7
5		.8
6		.9
7		1.0
8		1.2
9		
10		
11		
12		
13		
14	5.0	.5
15		
16		
17		
18		
19		.2
20		.1
21		.1
22		.1
23		.05
24		.05
25	5.0	.05
26		0
27		----------
28	5.0	----------
29		----------
30		----------
31	----------	----------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 4-30	5.0	3.0	4.92	264
May 1-26	4.0	0	.74	38.2
The period	----------	----------	----------	292

NOTE.—Canal opened Apr. 4; closed May 27

Digitized by Google

WHITEWATER CREEK NEAR INTERNATIONAL BOUNDARY

LOCATION.—Water-stage recorder in NW. ¼ sec. 24, T. 37 N., R. 29 E., just below mouth of North Fork of Whitewater Creek, 3½ miles south of international boundary, 5 miles northeast of Lowrane, Mont., and 18 miles south of Roche Plain, Saskatchewan.

RECORDS AVAILABLE.—March, 1927, to September, 1929.

EXTREMES.—Maximum discharge during year, 5.6 second-feet Apr. 30 (gage height, 1.31 feet); no flow at times during year.

1927–1929: Maximum discharge, 1,140 second-feet Apr. 5, 1927 (gage height, 4.71 feet); no flow at times in 1927 and 1929.

REMARKS.—Records good. Discharge estimated Oct. 30, 31, and Mar. 15–18. Observations discontinued Nov. 1 to Mar. 14. No diversions. Station maintained jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2		1.3	2.2	0.5	0	0.05	0
2	.3		1.1	1.6	1.0	0	.04	0
3	.3		.8	1.2	2.3	0	.04	0
4	.4		.9	1.0	1.8	0	.05	0
5	.4		1.0	.9	1.1	0	.05	0
6	.4		1.6	.8	.8	0	.05	.02
7	.4		1.0	.8	.8	.05	.05	.1
8	.4		1.0	.7	.8	.1	.05	.1
9	.4		.9	.9	.8	.1	.10	.1
10	.4		.8	1.5	.9	.05	.05	.1
11	.4		.8	1.4	.8	.05	.05	.2
12	.4		1.0	1.1	.6	.04	.05	.2
13	.4		.8	1.0	.5	.02	.04	.1
14	.4		.9	.9	.5	0	0	1
15	.4	1.8	.8	.8	.6	.01	0	1
16	.3	1.9	1.0	.8	.7	.01	0	.1
17	.3	1.8	.8	.8	1.2	.01	0	.1
18	.3	1.7	.8	.8	2.2	.02	0	.1
19	.3	1.7	.8	.8	1.8	.05	0	.1
20	.3	1.3	.7	.6	1.1	.02	0	.1
21	.3	1.4	.7	.6	.8	0	0	.1
22	.3	1.4	.8	.6	.5	0	0	.1
23	.4	1.1	.8	.6	.3	0	0	.2
24	.4	1.3	.8	.6	.2	0	0	.4
25	.4	1.3	.8	.6	.1	0	0	.3
26	.4	1.0	.8	.6	.02	0	0	.2
27	.4	.9	.8	.8	.01	0	0	.3
28	.4	1.2	.8	1.0	0	0	0	.3
29	.5	1.7	1.2	1.7	0	.01	0	.3
30	.5	1.2	4.7	1.1	0	.05	0	.3
31	.5	1.4		.6		.05	0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	0.5	0.2	0.37	22.8
March 15–31	1.9	.9	1.42	47.9
April	4.7	.7	1.03	61.3
May	2.2	.6	.95	58.4
June	2.3	0	.758	45.1
July	.1	0	.021	1.3
August	.1	0	.022	1.4
September	.4	0	.137	8.2

Digitized by Google

FRENCHMAN RIVER AT INTERNATIONAL BOUNDARY

LOCATION.—Water-stage recorder in SW. ¼ sec. 4, T. 1, R. 10 W. third meridian, in Saskatchewan, Canada, just across international boundary from east side of lot 3, sec. 6, T. 37 N., R. 34 E.

DRAINAGE AREA.—1,875 square miles.

RECORDS AVAILABLE.—April, 1917, to September, 1929.

EXTREMES.—Maximum discharge during year, 637 second-feet Apr. 29 (gage height, 4.37 feet); no flow Sept. 3–28.

1917–1929: Maximum discharge, 5,440 second-feet Mar. 29, 1925 (gage height, 13.12 feet); no flow at times.

REMARKS.—Records good except those for period of ice effect, Mar. 1 to Apr. 3, and for estimated periods, which are fair. Observations discontinued Nov. 1 to Feb. 28. Numerous diversions in Canada. Station maintained jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20.8	4.0	160	294	*89	*56	*7.1	*0.1
2	20.8	4.0	125	270	*94	51	6.0	.1
3	20.8	4.0	101	270	*100	*48	*6.9	*0
4	20.8	4.0	122	249	107	42.5	*7.8	0
5	22.0	4.0	124	226	*108	*40.6	8.7	*0
6	22.9	4.5	122	211	109	38.8	*10.0	*0
7	23.8	5.0	138	182	*100	*38.2	16.7	0
8	24.7	4.5	84	166	90	37.6	*12.3	*0
9	24.7	4.0	98	158	*95	*38.2	*8.0	0
10	25.6	10.9	86	163	129	38.8	3.6	*0
11	27.4	19.0	193	156	*110	*35.2	*3.4	0
12	28.3	24.0	193	150	96	31.6	3.2	*0
13	28.3	28.0	214	143	*85	*30.3	2.6	0
14	28.3	25.0	233	138	75	*29.1	2.4	*0
15	27.4	22.9	185	131	*75	27.8	*2.9	*0
16	26.5	18.0	168	129	*80	*28.8	3.4	*0
17	25.6	13.6	163	129	143	29.7	*2.9	0
18	25.6	13.0	148	129	*100	*28.8	*2.4	*0
19	25.6	13.6	143	131	64	27.8	1.9	0
20	25.6	25.6	150	138	*64	*24.5	*1.6	*0
21	24.7	75	156	146	*64	*21.3	1.2	0
22	25.6	123	174	140	*64	18.1	*1.1	*0
23	24.7	88	270	131	64	*17.4	1.0	0
24	25.6	86	381	122	*61	16.7	*.9	*0
25	26.5	84	490	117	58	*15.4	*.7	*0
26	25.6	93	560	109	*68	14.1	.6	*0
27	25.6	76	601	107	79	*12.7	*.5	0
28	25.6	80	627	104	*73	*11.2	.4	*0
29	26.5	86	606	98	67	9.8	*.3	*3.6
30	27.4	100	420	94	*62	*9.0	.2	7.1
31	*27.0	189	-------	84	-------	8.2	*.2	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	28.3	20.8	25.2	1,550
March	189	4.0	43.0	2,640
April	627	84	241	14,300
May	294	84	155	9,530
June	143	58	85.8	5,110
July	56	8.2	28.3	1,740
August	16.7	.2	3.90	240
September	7.1	0	.36	21

* Estimated.

Digitized by Google

FRENCHMAN CANAL NEAR SACO, MONT.

LOCATION.—Staff gage in NE. ¼ sec. 27, T. 33 N., R. 34 E., 14 miles northeast of Saco.

RECORDS AVAILABLE.—May, 1928, to August, 1929, irrigation seasons only.

REMARKS.—Records fair. This canal diverts from Frenchman River for irrigation of land along the river.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Day	Apr.	May	June	July	Aug.
1		5.5	7.3	2.4	7.6	16		5.3	7.9	11.0	5.8
2		4.9	7.4	3.7	7.5	17		5.3	9.2	10.8	5.2
3		4.5	7.4	8.0	7.5	18		5.3	7.1	11.0	4.8
4		4.5	7.5	7.9	7.5	19		5.2	4.1	11.0	4.4
5		4.5	7.3	2.4	7.2	20		5.2	7.2	11.0	3.8
6		4.5	7.5	5.4	6.6	21		5.2	8.5	11.0	3.1
7		5.6	7.5	10.4	6.4	22		5.2	4.8	5.5	1.4
8		2.8	7.0	10.5	6.0	23		5.2	9.0	0	------
9		4.0	6.4	10.6	5.9	24	8.3	6.2	9.1	0	------
10		4.1	6.4	10.7	6.0	25	8.3	7.7	9.2	7.8	------
11		4.4	6.5	10.8	6.0	26	9.8	7.7	9.2	9.1	------
12		4.8	6.5	10.9	7.8	27	9.8	7.6	9.6	8.8	------
13		5.3	6.7	11.0	7.4	28	9.8	7.6	9.6	8.9	------
14		5.4	6.5	11.0	6.8	29	9.8	7.5	9.2	8.4	------
15		5.3	7.1	11.0	6.4	30	6.9	7.5	8.8	8.0	------
						31		7.4		7.6	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 24–30	9.8	6.9	8.96	124
May	7.7	2.8	5.52	339
June	9.6	4.1	7.58	451
July	11.0	0	8.28	509
August 1–22	7.8	1.4	5.96	260
The period				1,680

NOTE.—Canal opened Apr. 24; closed July 22; opened July 25; closed Aug. 22.

Digitized by Google

ROCK CREEK AT INTERNATIONAL BOUNDARY

LOCATION.—Chain gage in SW. ¼ sec. 1, T. 37 N., R. 37 E., at Bowrey ranch, three-fourths mile south of international boundary, 2 miles above Horse Creek, and 5 miles west of Barnard, Mont.

DRAINAGE AREA.—242 square miles.

RECORDS AVAILABLE.—March, 1927, to September, 1929.

EXTREMES.—Maximum discharge during year, 56 second-feet Mar. 30 (gage height, 3.74 feet); no flow June 13–18, Sept. 27 and 28.

1927–1929: Maximum discharge, 982 second-feet Apr. 6, 1927 (gage height, 10.51 feet); no flow Mar. 1–17, 1927, and June 13–18, Sept. 27 and 28, 1929.

REMARKS.—Records good except those for period of ice effect, Mar. 18–27, and for estimated periods, which are fair. Observations discontinued Nov. 1 to Mar. 17. One small diversion above gage. Station maintained jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			23.2	7.4	9.3	2.3	0.2	0.1
2			19.8	8.5	5.7	*2.2	*.2	.1
3	*3.8		17.7	9.0	6.2	*2.1	.1	.1
4			19.2	8.8	5.7	*2.1	.1	.1
5			16.3	7.7	5.7	2.0	.1	.04
6			15.4	6.7	5.2	1.8	.2	.04
7			14.6	6.0	5.0	1.8	.2	.02
8	*3.8		13.2	5.7	4.6	1.8	.1	.02
9			11.8	5.5	*4.3	1.7	.1	*.02
10			1.6	7.2	4.0	1.6	*.2	*.02
11			2.8	9.8	3.9	1.5	.4	*.02
12			1.5	11.8	3.9	1.5	.4	.02
13			3.1	8.8	0	1.4	.1	.1
14			.8	*10.3	0	1.3	.1	.04
15	*3.7		*5.0	11.8	0	1.2	.2	*.03
16			9.3	12.1	*0	1.2	.1	.02
17			11.8	11.5	0	1.1	.1	*.02
18		10.6	9.8	9.3	0	1.0	.2	.02
19		15.0	10.9	9.0	1.1	.9	.1	.04
20		25.0	9.0	7.7	.2	.9	.1	*.05
21		15.5	7.7	7.7	.2	.8	.1	.1
22		31.8	7.4	7.2	.2	.7	.1	.04
23		14.4	7.4	7.2	.2	.6	.1	.1
24		13.1	9.3	6.4	1.0	.6	.2	*.1
25		12.4	10.9	6.0	.6	.5	.1	*.1
26	*3.7	13.6	6.0	9.3	1.2	.4	.1	*.02
27		20.3	5.5	8.5	3.1	*.3	.1	0
28		40.2	6.0	*8.4	1.1	.3	.1	0
29		49.2	6.0	8.2	2.4	.2	.1	.1
30		56	6.9	7.4	2.3	.2	.1	*.1
31		38.4	-------	10.9	-------	.2	.1	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	-------	-------	3.73	229
March 18–31	56.0	10.6	25.4	705
April	23.2	.8	9.67	575
May	12.1	5.5	8.45	520
June	9.3	0	2.57	153
July	2.3	.2	1.17	71.9
August	.4	.1	.14	8.6
September	.1	0	.055	3.2

* Estimated.

Digitized by Google

HORSE CREEK AT INTERNATIONAL BOUNDARY

LOCATION.—Staff gage in SE. ¼ sec. 3, T. 37 N., R. 37 E., three-quarters of a mile south of international boundary and 8 miles west of Barnard, Mont.

DRAINAGE AREA.—71 square miles.

RECORDS AVAILABLE.—March, 1927, to September, 1929. May, 1914, to October, 1926, station maintained by Department of the Interior, Canada.

EXTREMES.—Maximum discharge during year, 31.7 second-feet Mar. 29 (gage height, 3.59 feet); no flow at times during year.

1914–1929: Maximum discharge, 1,040 second-feet Mar. 30, 1925 (gage height, 10.85 feet); no flow at times.

REMARKS.—Records fair. Stage-discharge relation affected by ice Oct. 29–31 and Mar. 12–26. Observations discontinued Nov. 1 to Feb. 28. No diversions. Station maintained jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Mar.	Apr.	May	June	July	Day	Oct.	Mar.	Apr.	May	June	July
1	0.10	0	7.4	*0.4	*0.10	*0.01	16	*0.04	0.2	*1.6	*0.6	*0.10	*0
2	*.10	0	6.3	.4	*.10	.01	17	*.04	*.2	1.4	*.5	.10	*0
3	*.10	0	*4.0	*.4	.10	*.01	18	*.03	.3	1.3	*.5	*.10	*0
4	*.10	0	3.7	.4	.10	*.01	19	*.03	.2	*1.3	*.4	*.10	*0
5	*.10	0	4.7	*.4	*.10	0	20	*.02	2.0	1.2	*.4	.04	*0
6	*.10	0	1.4	.3	*.10	*0	21	.02	2.0	1.1	.3	*.03	*0
7	*.10	0	2.0	*.3	.10	*0	22	*.02	7.1	*1.0	*.3	*.02	*0
8	*.10	0	2.2	.3	*.10	0	23	*.02	4.3	*1.0	.3	*.02	*0
9	*.10	0	2.2	*.3	.10	*0	24	*.02	3.1	.9	*.2	.01	*0
10	.10	0	1.2	*.3	*.10	*0	25	*.02	8.7	*.2	.1	.02	0
11	*.10	0	1.3	.3	.10	0	26	*.02	10.4	*.7	*.1	.01	*0
12	*.10	*.1	*1.3	.3	*.04	*0	27	*.02	6.6	*.6	.1	*.01	*0
13	*.10	*.1	1.3	*.4	*.03	*0	28	.02	18.0	.5	*.1	*.01	0
14	.10	*.1	1.0	*.5	.02	0	29	*.02	28.4	.5	*.1	*.01	*0
15	*.10	*.1	1.7	.6	*.04	*0	30	*.02	14.9	*.5	.1	*.01	*0
							31	.03	13.5	-------	*.1	-------	*0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	0.10	0.02	0.061	3.8
March	28.4	0	3.88	239
April	7.4	.5	1.87	111
May	.6	.1	.32	19.7
June	.1	.01	.061	3.6
July	.01	0	.001	.1

* Estimated.

NOTE.—No flow during August and September.

Digitized by Google

McEACHERN CREEK AT INTERNATIONAL BOUNDARY

LOCATION.—Staff gage in SW. ¼ sec. 1, T. 37 N., R. 36 E., half a mile south of international boundary at Dolson ranch and 7 miles north of Thoeny, Mont.

DRAINAGE AREA.—160 square miles.

RECORDS AVAILABLE.—March, 1927, to September, 1929. March, 1924, to October, 1926, station maintained by the Department of the Interior, Canada, above east fork of this stream.

EXTREMES.—Maximum discharge during year, about 72 second-feet Mar. 30 (gage height, 3.38 feet); no flow at times during year.

1927–1929: Maximum discharge, 1,850 second-feet Apr. 9, 1927 (gage height, 10.42 feet); no flow at times.

REMARKS.—Records good below 50 second-feet and fair above. Stage-discharge relation affected by ice Mar. 14 to Apr. 2. Observations discontinued Nov. 1 to Feb. 28. Station maintained jointly with the Dominion Water and Hydrometric Bureau, Department of the Interior, Canada.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Mar.	Apr.	May	June	Day	Oct.	Mar.	Apr.	May	June
1	0.01	0	33.8	0.4	0.1	16	0.01	0.2	1.2	0.2	0.1
2	.01	0	13.8	.4	.1	17	.01	1.7	1.2	.2	.1
3	.01	0	12.2	.3	.1	18	01	4.0	1.2	.2	.1
4	.01	0	12.9	.2	.1	19	.01	9.0	1.1	.2	.1
5	.01	0	15.4	.2	.1	20	.01	20.1	1.1	.2	.1
6	.01	0	13.2	.2	.1	21	.01	16.6	.9	.1	.1
7	.01	0	10.2	.2	.1	22	.01	25.1	.9	.1	.02
8	.01	0	7.2	.2	.1	23	.01	26.9	.7	.1	.02
9	.01	0	3.6	.2	.1	24	.01	31.6	.6	.1	.01
10	.01	0	3.0	.2	.1	25	.01	17.6	.5	.1	0
11	.01	0	2.2	.2	.1	26	.01	12.8	.5	.1	0
12	.01	0	1.8	.2	.1	27	.01	12.1	.5	.1	0
13	.01	0	1.4	.2	.1	28	.01	13.8	.5	.1	0
14	.01	.1	1.2	.2	.1	29	.01	41.1	.4	.1	0
15	.01	.1	1.1	.2	.1	30	.01	63.0	.4	.1	0
						31	.01	51.0	-------	.1	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	0.01	0.01	0.010	0.6
March	63	0	11.2	689
April	33.8	.4	4.82	287
May	.4	.1	.18	11.1
June	.1	0	.072	4.3

NOTE.—No flow during July, August, and September.

Digitized by Google

YELLOWSTONE RIVER BASIN

YELLOWSTONE LAKE AT LAKE HOTEL, YELLOWSTONE NATIONAL PARK

LOCATION.—Staff gage at boat landing directly in front of Lake Hotel and 1½ miles southwest of outlet of Yellowstone Lake. Zero of gage is 7,729.51 feet above mean sea level.

DRAINAGE AREA.—1,010 square miles.

RECORDS AVAILABLE.—October, 1921, to September, 1929.

EXTREMES.—Maximum stage during year, 4.04 feet July 5; minimum, 0.95 foot Nov. 18. Lower stage occurred during period when lake was frozen.

1921–1929: Maximum stage, 6.12 feet June 30, 1927; minimum, 0.36 foot Dec. 17, 1921. Lower stage may have occurred at times during winter.

REMARKS.—Records good. Observations discontinued during winter. No artificial regulation.

Daily gage height, in feet, 1928–29

Day	Oct.	Nov.	June	July	Aug.	Sept.	Day	Oct.	Nov.	June	July	Aug.	Sept.
1	------	------	------	3.91	2.98	1.90	16	1.30	------	3.27	3.61	2.35	1.50
2	------	1.10	------	3.95	2.93	1.88	17	------	1.00	3.35	3.58	2.32	1.48
3	1.60	------	------	3.95	2.89	1.90	18	1.30	.95	3.45	3.55	2.29	1.42
4	1.58	1.10	------	3.97	2.87	1.88	19	------	------	3.47	------	2.23	1.40
5	1.50	------	------	4.04	2.84	1.82	20	1.20	------	3.47	3.45	2.14	------
6	------	1.10	------	4.00	2.79	1.76	21	------	------	3.48	3.48	2.17	1.40
7	1.38	------	2.18	3.93	2.76	1.76	22	1.20	------	3.56	3.43	2.14	------
8	------	1.00	2.26	3.89	2.72	1.74	23	------	------	3.56	3.40	2.12	1.40
9	1.36	------	------	3.82	2.67	1.70	24	1.20	------	3.59	3.35	2.06	------
10	------	1.00	------	3.79	2.63	1.68	25	------	------	3.62	3.30	2.02	------
11	1.36	1.00	2.65	3.75	2.57	1.66	26	------	------	3.67	3.25	2.01	------
12	------	------	2.78	3.75	2.54	1.60	27	1.20	------	3.70	3.20	1.98	1.38
13	1.36	1.00	2.82	3.69	2.47	1.60	28	------	------	3.79	3.18	1.95	1.36
14	------	------	------	3.64	2.43	1.55	29	1.20	------	3.81	3.17	1.92	------
15	------	1.00	3.05	3.62	2.40	------	30	------	------	3.88	3.06	1.95	------
							31	1.20	------	------	3.04	1.91	------

Digitized by Google

YELLOWSTONE RIVER AT YELLOWSTONE LAKE OUTLET, YELLOWSTONE NATIONAL PARK

LOCATION.—Water-stage recorder installed Oct. 2, 1928, 550 feet below Fishing Bridge, a quarter of a mile below outlet of Yellowstone Lake; elevation of zero, 7,727.84 feet above mean sea level. Staff gage at Fishing Bridge is also used, zero of which is 7,728.90 feet above mean sea level.

DRAINAGE AREA.—1,010 square miles.

RECORDS AVAILABLE.—December, 1922, to September, 1929. Gage-height records only prior to October, 1926.

EXTREMES.—Maximum discharge during year, 3,700 second-feet July 2–5; maximum gage height at Fishing Bridge site, 4.38 feet July 5; minimum discharge, 515 second-feet Jan. 25 (gage height, 0.74 foot at Fishing Bridge site).

1922–1929: Maximum discharge, 7,420 second-feet June 29, 30, and July 1, 1927 (gage height, 6.3 feet at Fishing Bridge site); minimum, that of Jan. 25, 1929.

REMARKS.—Records good above 1,000 second-feet; others fair to poor. Records for period Dec. 9 to May 18, which were estimated in part, were obtained at Fishing Bridge site; records for remainder of year were obtained at recorder site, 550 feet below. No regulation.

Daily gage height, in feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		1.43					1.17			4.32	3.40	2.34
2		1.43		1.03				1.03		4.33	3.39	2.32
3	2.03									4.37	3.33	2.33
4		1.43	1.13							4.36	3.33	2.32
5	2.03						.98			4.38	3.30	2.29
6										4.33	3.24	2.27
7					1.18	1.23			2.73	4.27	3.22	2.25
8		1.48						1.13	2.77	4.23	3.18	2.21
9			1.11							4.21	3.14	2.19
10										4.14	3.10	2.17
11									3.17	4.09	3.04	2.15
12				.94					3.23	4.07	3.00	2.13
13		1.43					1.13		3.32	4.07	2.94	2.11
14										4.03	2.89	2.05
15		1.33				1.23			3.47	4.03	2.84	
16			1.08		1.23			1.13	3.59	4.01	2.83	2.03
17									3.79	3.99	2.79	2.01
18		1.39							3.93	3.94	2.78	1.95
19				.93					3.88		2.75	1.93
20					1.24	1.13			3.90	3.87	2.67	1.91
21									3.93	3.85	2.71	1.91
22							1.03		3.93	3.84	2.63	1.93
23									3.99	3.78		1.91
24		1.33	.93						4.03	3.72	2.55	
25	1.63			.74					4.04	3.69	2.52	1.85
26					1.28				4.08	3.63	2.51	
27						1.13			4.11	3.60	2.48	1.91
28		1.23							4.16	3.54	2.47	1.88
29	1.53								4.14	3.51	2.43	
30								2.23	4.28	3.47	2.43	
31										3.42	2.41	

NOTE.—The gage-height record, collected at the Fishing Bridge gage, shows approximate stages in Yellowstone Lake, but owing to a small amount of fall between main body of lake and gage, daily stages as obtained vary slightly from elevations determined at gage in Yellowstone Lake at the Lake Hotel. Add 7,728.90 feet to above readings to reduce to mean sea level datum.

Digitized by Google

Daily and monthly discharge, in second-feet, of Yellowstone River at Yellowstone Lake outlet, Yellowstone National Park, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,040	772	630	585	577	655	615	588	1,200	3,620	2,300	1,290
2	1,040	750	630	588	586	654	605	588	1,290	3,700	2,230	1,290
3	1,040	750	630	585	595	652	595	592	1,340	3,700	2,170	1,240
4	1,000	750	615	583	604	650	585	597	1,380	3,700	2,170	1,240
5	1,000	750	600	580	612	648	575	602	1,380	3,700	2,110	1,200
6	970	750	585	578	621	647	580	606	1,470	3,620	2,050	1,200
7	970	772	590	575	630	645	585	610	1,520	3,620	2,050	1,200
8	938	750	595	572	632	645	590	615	1,620	3,540	1,990	1,160
9	938	750	600	570	633	645	595	613	1,720	3,460	1,940	1,120
10	938	750	600	567	635	645	600	611	1,820	3,380	1,880	1,120
11	938	728	600	565	637	645	605	610	1,940	3,380	1,880	1,120
12	905	728	600	562	638	645	610	608	2,050	3,300	1,820	1,080
13	905	728	600	562	640	655	615	606	2,170	3,220	1,770	1,080
14	905	728	600	562	642	645	612	604	2,230	3,140	1,720	1,040
15	875	705	600	562	643	645	609	602	2,360	3,140	1,720	1,040
16	875	705	600	562	645	639	606	600	2,560	3,140	1,670	1,040
17	875	705	595	562	645	633	603	615	2,840	3,070	1,620	1,000
18	875	705	590	562	645	627	600	615	3,000	3,000	1,620	1,000
19	845	705	586	562	645	621	597	630	3,000	3,000	1,570	970
20	845	685	581	554	645	615	594	648	3,070	3,000	1,520	970
21	845	685	576	546	648	615	591	685	3,070	2,920	1,520	970
22	845	665	572	538	650	615	588	728	3,070	2,840	1,470	970
23	820	665	567	531	652	615	588	772	3,140	2,770	1,470	970
24	820	665	562	523	655	615	588	845	3,220	2,700	1,420	938
25	820	665	565	515	658	615	588	938	3,220	2,700	1,380	938
26	795	665	568	524	660	615	588	1,040	3,300	2,630	1,380	938
27	795	648	571	533	659	615	588	1,080	3,380	2,560	1,380	938
28	795	648	574	542	657	615	588	1,120	3,460	2,490	1,340	938
29	795	648	576	550	.....	615	588	1,120	3,540	2,420	1,340	905
30	772	648	579	559	.....	615	588	1,160	3,620	2,360	1,340	905
31	772	.....	582	568	.....	615	.....	1,160	.....	2,360	1,340	.....

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	1,040	772	890	0.881	1.02	54,700
November	772	648	709	.702	.78	42,200
December	630	562	591	.585	.67	36,300
January	588	515	559	.553	.64	34,400
February	660	577	635	.629	.66	35,300
March	655	615	633	.627	.72	38,900
April	615	575	595	.589	.66	35,400
May	1,160	588	736	.729	.84	45,300
June	3,620	1,200	2,430	2.41	2.69	145,000
July	3,700	2,360	3,100	3.07	3.54	191,000
August	2,300	1,340	1,720	1.70	1.96	106,000
September	1,290	905	1,060	1.05	1.17	63,100
The year	3,700	515	1,140	1.13	15.35	828,000

Digitized by Google

YELLOWSTONE RIVER NEAR CANYON HOTEL, YELLOWSTONE NATIONAL PARK

LOCATION.—Water-stage recorder half a mile upstream from Upper Falls and Canyon ranger station, 1¼ miles south of Canyon Hotel, and 13 miles below outlet of Yellowstone Lake.

DRAINAGE AREA.—1,160 square miles (revised).

RECORDS AVAILABLE.—June, 1913, to September, 1929.

EXTREMES.—Maximum discharge during year, 3,740 second-feet July 2 (gage height, 2.8 feet); minimum, 932 second-feet Sept. 30 (gage height, 1.05 feet). 1913–1929: Maximum discharge, 8,550 second-feet June 27, 1918 (gage height, 4.50 feet); minimum, 664 second-feet Sept. 6, 1919 (gage height, 0.72 foot). Lower stages probably occurred during periods of no record.

REMARKS.—Records excellent. Discharge estimated Oct. 1, Aug. 17, and 18. Observations discontinued Oct. 6 to May 30. No regulation or diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	May	June	July	Aug.	Sept.	Day	Oct.	May	June	July	Aug.	Sept.
1	1,080	-------	1,700	3,640	2,370	1,350	16	-------	-------	2,920	3,120	1,730	1,060
2	1,060	-------	1,680	3,740	2,330	1,340	17	-------	-------	3,120	3,120	1,700	1,050
3	1,050	-------	1,660	3,640	2,280	1,340	18	-------	-------	3,420	3,120	1,670	1,030
4	1,050	-------	1,650	3,640	2,260	1,290	19	-------	-------	3,320	3,120	1,640	1,020
5	1,040	-------	1,700	3,640	2,220	1,260	20	-------	-------	3,320	3,020	1,620	1,010
6	-------	-------	1,760	3,640	2,170	1,240	21	-------	-------	3,320	2,920	1,580	1,020
7	-------	-------	1,920	3,530	2,130	1,230	22	-------	-------	3,320	2,920	1,540	1,020
8	-------	-------	2,060	3,530	2,080	1,220	23	-------	-------	3,220	2,830	1,510	1,000
9	-------	-------	2,190	3,640	2,030	1,200	24	-------	-------	3,320	2,830	1,500	984
10	-------	-------	2,300	3,640	1,960	1,180	25	-------	-------	3,320	2,730	1,460	958
11	-------	-------	2,460	3,420	1,920	1,160	26	-------	-------	3,420	2,730	1,430	966
12	-------	-------	2,540	3,320	1,890	1,140	27	-------	-------	3,420	2,640	1,420	984
13	-------	-------	2,640	3,320	1,850	1,120	28	-------	-------	3,530	2,540	1,410	975
14	-------	-------	2,730	3,220	1,790	1,100	29	-------	-------	3,640	2,520	1,400	958
15	-------	-------	2,830	3,120	1,760	1,080	30	-------	-------	3,640	2,460	1,400	941
							31	-------	1,660	-------	2,410	1,370	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October 1–5	1,080	1,040	1,060	0.914	0.17	10,500
June	3,640	1,650	2,740	2.36	2.63	163,000
July	3,740	2,410	3,150	2.72	3.14	194,000
August	2,370	1,370	1,790	1.54	1.78	110,000
September	1,350	941	1,110	.957	1.07	66,000

Digitized by Google

YELLOWSTONE RIVER AT CORWIN SPRINGS, MONT.

LOCATION.—Chain gage in NE. ¼ sec. 30, T. 8 S., R. 8 E., at highway bridge in canyon at Corwin Springs, 8 miles north of Gardiner.

DRAINAGE AREA.—2,630 square miles.

RECORDS AVAILABLE.—September, 1910, to September, 1929.

EXTREMES.—Maximum discharge during year, 14,400 second-feet June 17 (gage height, 7.4 feet); minimum, 800 second-feet Jan. 20 to Mar. 3.

1910–1929: Maximum discharge, about 26,500 second-feet June 14 and 15, 1918 (gage height, 11.5 feet); minimum (estimated), 720 second-feet Jan. 8–10, 1920.

REMARKS.—Records excellent except those for estimated periods, which are fair. No diversions. Natural storage in Yellowstone Lake.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,700	1,310	1,080	950	*800	800	1,010	1,310	7,350	10,200	3,510	1,930
2	1,700	1,220	1,010	950	*800	800	1,010	1,310	9,560	9,860	3,510	1,930
3	1,700	1,220	1,010	950	800	800	1,010	1,220	6,840	9,270	3,350	1,930
4	1,700	1,220	1,010	950	800	845	1,010	1,140	5,650	8,980	3,350	1,930
5	1,700	1,220	*1,010	950	800	845	1,080	1,140	7,090	8,150	3,350	1,810
6	1,700	1,310	*1,010	*950	800	895	1,080	1,140	8,150	7,610	3,190	1,810
7	1,700	1,310	*1,010	*922	800	895	1,010	1,140	9,560	7,350	3,190	1,810
8	1,700	1,310	*1,010	895	*800	950	1,010	1,140	11,100	6,840	3,030	1,810
9	1,700	1,310	1,010	895	*800	950	1,010	1,140	11,400	6,590	3,030	1,700
10	1,600	1,310	1,010	950	*800	950	1,010	1,220	11,700	6,350	2,880	1,700
11	1,600	1,310	*1,010	950	*800	950	1,010	1,220	10,800	6,350	2,740	1,700
12	1,600	1,310	*1,010	895	*800	950	1,010	1,310	10,500	6,110	2,740	1,700
13	1,600	1,220	1,010	895	*800	950	1,010	1,700	11,400	5,880	2,600	1,600
14	1,600	1,220	1,010	895	*800	950	1,010	2,060	13,000	5,880	2,460	1,600
15	1,600	1,220	1,010	895	*800	950	1,010	2,190	13,700	5,650	2,320	1,600
16	1,600	1,220	950	895	*800	950	1,010	2,460	14,000	5,430	2,460	1,500
17	1,600	1,220	950	950	*800	950	1,080	3,190	14,400	5,430	2,460	1,500
18	1,600	1,220	950	895	*800	1,010	1,080	3,350	11,100	5,210	2,320	1,500
19	1,500	1,220	950	845	*800	1,010	1,080	3,680	9,860	5,430	2,320	1,400
20	1,500	1,140	*950	*800	800	1,010	1,080	5,000	8,700	5,210	2,320	1,400
21	1,500	1,140	*950	*800	800	1,010	1,140	6,110	8,980	5,000	2,190	1,400
22	1,500	1,140	*950	*800	800	1,010	1,140	7,350	9,270	4,590	2,190	1,400
23	1,500	1,080	*950	*800	800	950	1,140	8,980	9,860	4,400	2,190	1,500
24	1,500	1,080	*950	*800	800	950	1,140	9,860	9,860	4,210	2,060	1,500
25	1,500	1,080	950	*800	800	950	1,080	13,000	10,500	4,210	1,930	1,500
26	1,500	1,080	950	*800	800	950	1,080	10,500	11,100	4,210	1,930	1,600
27	1,500	1,080	950	*800	800	950	1,080	5,650	11,400	4,030	1,930	1,600
28	1,500	1,080	950	*800	800	1,010	1,140	4,790	11,100	3,850	1,930	1,600
29	1,400	1,080	950	*800	------	1,010	1,310	4,590	11,700	3,680	1,930	1,500
30	1,400	1,080	950	*800	------	1,010	1,400	4,590	11,400	3,510	2,060	1,500
31	1,400	------	950	*800	------	1,010	------	6,110	------	3,510	1,930	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	1,700	1,400	1,580	0.601	0.69	97,200
November	1,310	1,080	1,200	.456	.51	71,400
December	1,080	950	981	.373	.43	60,300
January	950	800	873	.332	.38	53,700
February	800	800	800	.304	.32	44,400
March	1,010	800	943	.359	.41	58,000
April	1,400	1,010	1,080	.411	.46	64,200
May	13,000	1,140	3,860	1.47	1.70	237,000
June	14,400	5,650	10,400	3.95	4.41	619,000
July	10,200	3,510	5,900	2.24	2.58	363,000
August	3,510	1,930	2,560	.973	1.12	157,000
September	1,930	1,400	1,630	.620	.69	97,000
The year	14,400	800	2,650	1.01	13.70	1,920,000

* Estimated because of ice.

Digitized by Google

YELLOWSTONE RIVER NEAR LIVINGSTON, MONT.

LOCATION.—Chain gage in NW. ¼ sec. 12, T. 3 S., R. 9 E., at highway bridge on Yellowstone Trail, 5 miles south of Livingston.

DRAINAGE AREA.—3,580 square miles.

RECORDS AVAILABLE.—May, 1897, to December, 1905; August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 19,000 second-feet June 17 (gage height, 7.42 feet); minimum, 930 second-feet Jan. 25 (gage height, 0.94 foot).

1897–1905, 1928–29: Maximum discharge, 26,800 second-feet June 1, 1897; minimum, that of Jan. 25, 1929.

REMARKS.—Records good except those for estimated periods, Oct. 1–7, 18–26, and Jan. 23, which are fair. Some diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,530	1,930	1,540	1,420	1,140	1,190	1,300	1,800	7,200	13,400	3,930	2,480
2		1,800	1,540	1,420	1,360	1,240	1,420	1,670	11,300	12,900	3,930	2,340
3		1,800	1,540	1,420	1,360	1,300	1,420	1,670	7,800	11,700	3,740	2,340
4		1,800	1,540	1,480	1,420	1,300	1,480	1,670	7,200	11,300	3,560	2,340
5		1,930	1,360	1,480	1,420	1,420	1,600	1,670	7,800	9,800	3,740	2,340
6		1,930	1,360	1,190	1,360	1,480	1,540	1,670	9,800	8,750	3,560	2,340
7		1,930	1,420	1,240	1,240	1,540	1,420	1,600	11,300	8,750	3,560	2,340
8	2,480	1,930	1,420	1,240	1,140	1,600	1,300	1,600	14,000	8,400	3,390	2,340
9	2,480	1,800	1,360	1,420	1,080	1,600	1,300	1,600	16,300	7,800	3,230	2,340
10	2,480	1,800	1,420	1,360	1,140	1,600	1,420	1,670	15,500	7,500	3,070	2,200
11	2,480	1,930	1,600	1,360	1,190	1,540	1,420	1,670	14,200	6,900	3,070	2,200
12	2,480	1,800	1,480	1,240	1,240	1,600	1,360	1,670	13,800	6,900	3,070	2,200
13	2,480	1,800	1,540	1,360	1,300	1,540	1,420	2,060	14,200	6,600	3,070	2,200
14	2,480	1,930	1,540	1,420	1,300	1,480	1,420	2,480	16,300	6,900	3,070	2,200
15	2,480	1,800	1,540	1,420	1,300	1,420	1,420	2,770	17,200	6,600	2,920	2,200
16	2,480	1,800	1,480	1,420	1,240	1,420	1,420	2,770	18,600	6,050	2,920	2,060
17	2,480	1,800	1,480	1,420	1,240	1,480	1,540	3,390	19,000	6,050	2,770	2,060
18	2,440	1,800	1,480	1,360	1,140	1,480	1,540	3,560	14,000	5,800	2,770	2,060
19	2,400	1,540	1,360	1,080	1,240	1,420	1,600	3,930	12,500	6,300	2,770	2,060
20	2,360	1,800	1,240	1,140	1,300	1,420	1,540	5,300	10,900	5,800	2,770	2,060
21	2,320	1,800	1,360	1,140	1,240	1,420	1,670	6,300	10,500	5,800	2,620	2,060
22	2,270	1,670	1,300	1,140	1,240	1,480	1,670	9,100	11,300	5,050	2,620	2,060
23	2,230	1,800	1,360	1,110	1,240	1,420	1,540	11,300	12,500	5,050	2,620	2,060
24	2,190	1,800	1,360	1,080	1,240	1,360	1,540	12,100	12,100	4,810	2,620	2,060
25	2,150	1,670	1,420	930	1,190	1,360	1,480	17,600	13,400	4,570	2,480	2,060
26	2,100	1,670	1,420	1,140	1,240	1,360	1,480	10,500	14,000	4,340	2,480	2,060
27	2,060	1,670	1,420	1,140	1,300	1,420	1,480	7,200	15,500	4,340	2,480	2,060
28	2,060	1,670	1,420	1,080	1,190	1,480	1,540	5,550	15,500	4,130	2,480	2,060
29	1,930	1,670	1,480	1,080	-------	1,600	1,800	5,300	16,300	4,130	2,480	2,060
30	1,800	1,540	1,540	1,190	-------	1,480	1,800	5,050	15,500	3,930	2,620	2,060
31	1,930	-------	1,600	1,240	-------	1,420	-------	6,600	--------	3,930	2,480	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2,530	1,800	2,350	144,000
November	1,930	1,540	1,790	107,000
December	1,600	1,240	1,450	89,200
January	1,480	930	1,260	77,500
February	1,420	1,080	1,250	69,400
March	1,600	1,190	1,440	88,500
April	1,800	1,300	1,500	89,300
May	17,600	1,600	4,610	283,000
June	19,000	7,200	13,200	786,000
July	13,400	3,930	6,910	425,000
August	3,930	2,480	3,000	184,000
September	2,480	2,060	2,180	130,000
The year	19,000	930	3,410	2,470,000

Digitized by Google

YELLOWSTONE RIVER AT BILLINGS, MONT.

LOCATION.—Wire gage in NE. ¼ sec. 34, T. 1 N., R. 26 E., at bridge on Custer Battlefield highway at Billings.

RECORDS AVAILABLE.—August, 1928, to September, 1929. May, 1904, to December, 1905, at highway bridge 2 miles east of Billings.

EXTREMES.—Maximum discharge during year, 31,500 second-feet June 16 and 17 (gage height, 9.10 feet); minimum, less than 2,600 second-feet during February.

1904–5, 1928–29: Maximum discharge, 32,600 second-feet June 20, 1904 (gage height, 10.6 feet); minimum, less than 2,600 second-feet during February, 1929.

REMARKS.—Records fair. Discharge estimated Nov. 30 to Mar. 7, July 21 to Aug. 2, and Sept. 23–30, because of ice or missing gage heights. Numerous diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4,760	4,570				3,250	4,220	4,950	12,300	25,000	7,000	3,880
2	4,760	4,570				3,370	4,220	4,950	17,100	23,200	6,650	3,880
3	4,570	4,390				3,630	4,570	4,760	21,400	21,900	6,300	3,880
4	4,570	4,390				3,630	4,570	4,760	15,400	20,500	6,300	4,070
5	4,570	4,390				3,630	4,950	4,760	14,600	19,700	6,300	4,260
6	4,570	4,390	3,100	2,830	2,600	3,500	4,760	4,760	14,600	17,700	6,300	4,460
7	4,570	4,390				4,950	4,060	4,760	16,600	16,400	6,040	4,670
8	4,570	4,390				6,300	3,770	4,760	20,100	16,800	5,790	4,460
9	4,570	4,220				6,550	3,630	4,570	24,100	14,800	5,550	4,460
10	4,570	4,060				6,550	3,770	4,950	26,800	13,200	5,320	4,260
11	5,150	4,060				5,580	3,500	4,950	25,900	13,200	5,100	4,070
12	5,150	4,060				4,760	3,500	4,760	25,000	13,200	4,880	4,070
13	5,150	4,060				4,220	3,500	4,950	23,600	13,200	4,460	4,070
14	5,150	4,060				3,910	3,370	5,150	26,400	13,200	4,260	3,880
15	5,150	4,060	3,300	3,200	2,700	3,910	3,500	6,550	30,600	14,000	4,070	3,880
16	4,950	4,220				4,060	3,500	6,810	31,500	13,200	4,070	3,700
17	4,950	4,220				4,060	3,770	6,810	31,500	12,900	3,880	3,700
18	4,950	4,060				4,060	3,910	7,350	30,100	12,500	3,880	3,530
19	4,950	4,060				4,220	4,060	8,200	24,600	12,900	4,070	3,530
20	4,950	4,060				4,060	4,220	8,500	21,400	13,600	3,880	3,360
21	4,950	4,060				3,910	4,390	9,800	17,900	13,000	3,880	3,360
22	4,950	4,060				3,770	4,570	11,600	17,500	12,000	3,880	3,360
23	4,950	4,060				3,630	4,390	14,600	18,300	11,000	3,700	
24	4,760	4,060				3,500	4,390	19,700	19,200	10,000	3,700	
25	4,760	4,220			3,000	3,500	4,570	24,100	19,200	9,500	3,700	
26	4,760	4,060	3,670	2,750		3,370	4,390	28,700	20,500	9,000	3,700	3,300
27	4,760	4,060				3,500	4,570	22,800	23,600	8,500	3,700	
28	4,760	4,060				3,630	4,220	17,500	23,600	8,300	3,700	
29	4,760	3,910			-------	5,150	4,760	14,200	24,100	7,900	3,700	
30	4,570	3,770			-------	5,810	4,950	13,000	26,800	7,600	3,700	
31	4,570	-------			-------	4,390	-------	11,600	-------	7,300	3,880	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	5,150	4,570	4,810	296,000
November	4,570	3,770	4,170	248,000
December	-------	-------	3,370	207,000
January	-------	-------	2,920	180,000
February	-------	-------	2,750	153,000
March	6,550	3,250	4,270	263,000
April	4,950	3,370	4,150	247,000
May	28,700	4,570	9,660	594,000
June	31,500	12,300	22,100	1,320,000
July	25,000	7,300	13,700	842,000
August	7,000	3,700	4,690	288,000
September	4,670	-------	3,770	224,000
The year	31,500	-------	6,710	4,860,000

Digitized by Google

YELLOWSTONE RIVER AT MILES CITY, MONT.

LOCATION.—Wire gage at highway bridge just below mouth of Tongue River at Miles City, Custer County. Prior to May 6, 1929, a staff gage at Chicago, Milwaukee & St. Paul Railway Co.'s pumping plant half a mile below bridge was used. New gage at independent datum.

RECORDS AVAILABLE.—September, 1922, to August, 1923; August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 60,300 second-feet June 18 and 19 (gage height, 11.2 feet); minimum, 4,000 second-feet Jan. 7.

1922–23, 1928–29: Maximum discharge, that of June 18 and 19, 1929 minimum (estimated), 1,800 second-feet Dec. 7, 1922.

REMARKS.—Records prior to May 5, fair; thereafter good. Observations discontinued Dec. 2 to Mar. 16, Sept. 3–11, and 15–30. Numerous diversions from main stream and tributaries above gage. Some storage on tributaries.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7,320	7,320	7,000				20,500	9,200	32,000	43,000	8,580	4,700
2	7,320	7,320					12,200	9,200	37,300	44,600	8,200	4,700
3	7,320	7,320					10,400	9,610	36,500	44,600	8,200	
4	7,320	7,320					11,800	10,400	40,500	38,900	8,200	
5	7,000	7,320					9,610	10,400	43,000	37,300	8,200	
6	7,000	7,320					10,400	14,100	38,900	35,800	8,200	
7	7,000	7,320		[a]4,000			11,800	13,200	33,500	32,700	8,200	
8	7,000	7,320					11,800	13,600	34,200	32,700	7,830	
9	6,690	7,320					10,400	14,100	35,800	29,100	7,830	
10	6,690	7,320					8,800	14,100	44,600	27,000	7,830	
11	7,000	7,660					7,320	13,600	49,800	23,700	7,130	
12	7,660	7,660					6,390	13,600	50,700	21,200	7,130	7,470
13	8,020	7,660					6,100	13,200	50,700	21,800	6,810	7,470
14	8,020	7,660					5,820	12,700	53,300	20,000	5,960	7,470
15	8,020	7,660			[a]4,280		5,820	12,700	52,400	19,400	5,960	
16	8,020	7,320					5,820	14,600	53,300	19,400	5,190	
17	8,400	7,000				12,800	5,820	[b]15,400	55,900	18,800	5,190	
18	8,400	6,690				10,000	5,820	16,100	60,300	18,800	4,940	
19	8,800	6,690				13,800	5,820	17,200	60,300	25,000	4,700	
20	8,400	6,390				16,200	7,000	18,200	55,900	20,600	4,940	
21	8,800	6,390				15,600	7,320	22,400	44,600	18,800	4,700	
22	8,800	6,390				15,600	7,660	27,000	[b]42,400	18,200	4,940	
23	8,400	6,390				15,600	7,660	26,300	[b]40,200	16,100	4,940	
24	8,400	6,390				15,000	8,020	29,800	[b]37,900	14,600	4,700	
25	8,400	6,390				13,800	8,400	32,700	[b]35,700	13,200	4,460	
26	8,020	6,390				12,200	9,200	40,500	33,500	12,700	4,460	
27	8,020	6,390				8,400	10,000	53,300	33,500	12,700	4,460	
28	7,660	6,690				7,660	9,200	55,900	35,800	9,780	4,460	
29	7,660	6,690				7,660	9,200	50,700	39,700	9,370	4,460	
30	7,660	7,000				12,800	9,200	42,100	40,500	9,370	4,460	
31	7,660					20,500		37,300		8,970	4,460	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	8,800	6,690	7,770	478,000
November	7,660	6,390	7,020	418,000
March 17–31	20,500	7,660	13,200	393,000
April	20,500	5,820	8,830	525,000
May	55,900	9,200	22,000	1,350,000
June	60,300	32,000	43,400	2,580,000
July	44,600	8,970	23,200	1,430,000
August	8,580	4,460	6,120	376,000

[a] Result of discharge measurement. [b] Estimated.

Digitized by Google

YELLOWSTONE RIVER AT INTAKE, MONT.

LOCATION.—Chain gage in NW. ¼ sec. 36, T. 18 N., R. 56 E., at Lower Yellowstone diversion dam at Intake.

DRAINAGE AREA.—66,800 square miles.

RECORDS AVAILABLE.—January, 1911, to September, 1929. August, 1903, to December, 1910, at Glendive, 18 miles upstream.

EXTREMES.—Maximum discharge during year, 94,600 second-feet June 7 (gage height, 9.00 feet); minimum, 1,930 second-feet Dec. 8 and 9 (gage height, 0.45 foot).

1903–1929: Maximum discharge, 159,000 second-feet June 21, 1921 (gage height, 12.6 feet); minimum (estimated), 1,200 second-feet Dec. 6–8, 1922, and Jan. 6 and 7, 1923.

REMARKS.—Records good except those for periods of ice effect, Dec. 29 to Jan. 5 and Jan. 14 to Mar. 9, which are fair. Discharge estimated Nov. 25 and 26. Head gates of Lower Yellowstone Canal are at left end of dam. Many other diversions above station. Some storage on tributaries.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7,810	7,810	6,500	7,010	4,350	7,010	33,800	15,100	39,600	38,400	10,800	6,250
2	7,540	7,810	6,250	6,750	4,810	7,270	27,600	15,100	36,000	41,000	10,800	6,750
3	7,270	7,810	6,250	7,010	4,810	7,270	19,800	15,800	37,200	41,000	9,550	6,750
4	7,540	7,810	5,040	6,750	5,280	7,270	16,600	15,800	46,400	37,200	9,550	6,750
5	7,810	7,810	4,350	6,750	5,280	7,810	16,600	15,100	52,200	34,900	9,550	6,750
6	7,540	7,540	4,350	6,540	5,520	8,370	19,800	12,800	49,400	33,800	10,200	7,270
7	7,270	7,270	3,900	6,250	5,520	12,200	24,900	12,200	84,800	32,700	10,200	7,270
8	7,270	7,540	1,930	6,250	5,520	21,500	24,000	12,200	39,600	29,600	9,550	7,810
9	7,270	7,810	1,930	7,270	5,520	23,200	19,800	12,800	37,200	28,600	9,550	8,370
10	7,270	7,810	2,570	7,270	5,760	39,600	17,400	14,300	43,600	27,600	9,550	9,550
11	7,270	7,810	3,230	7,010	5,760	39,600	15,100	13,600	59,800	25,800	9,550	9,550
12	7,270	7,810	4,120	7,010	5,760	41,000	14,300	12,800	56,800	23,200	9,550	9,550
13	7,270	7,810	5,040	7,010	5,760	62,900	12,800	12,200	56,600	21,500	9,550	9,550
14	7,270	7,810	6,500	7,010	6,000	62,900	12,800	11,500	53,800	21,500	9,550	9,550
15	7,540	7,810	5,040	6,500	6,000	45,000	12,200	12,200	50,800	19,800	8,950	8,950
16	7,810	7,810	4,810	6,250	6,000	26,700	11,500	11,500	47,800	19,800	8,370	8,950
17	8,370	7,810	6,500	6,000	5,760	19,800	10,800	12,800	53,800	21,500	7,810	8,370
18	8,370	7,810	6,250	5,760	5,520	18,200	10,800	15,100	58,200	20,600	7,270	8,370
19	8,370	7,810	6,500	5,520	5,280	19,800	10,800	15,400	61,400	19,800	7,010	8,370
20	8,370	7,810	7,010	5,520	5,760	23,200	10,800	17,400	59,800	23,200	6,750	8,370
21	8,950	7,810	6,500	5,520	6,000	26,700	11,500	19,800	50,800	20,600	6,750	8,370
22	8,950	7,810	7,270	5,280	6,000	28,600	11,500	20,600	56,800	19,800	6,750	8,370
23	8,950	7,810	6,750	5,040	5,760	28,600	12,200	21,500	34,900	19,800	6,500	8,370
24	8,370	7,270	7,010	4,810	6,000	25,800	12,800	24,000	31,600	18,200	6,500	8,370
25	8,370	7,100	6,250	4,810	6,000	22,300	13,600	27,600	31,600	16,600	6,250	8,370
26	8,370	6,930	7,010	4,580	6,250	18,200	13,600	36,000	31,600	15,100	6,250	8,950
27	8,370	6,750	7,010	4,580	6,500	16,600	15,100	47,900	31,600	14,300	6,250	8,950
28	8,370	6,750	7,010	4,580	6,750	15,100	16,600	62,900	32,700	13,600	6,250	9,550
29	7,810	6,750	6,750	4,580	------	16,600	15,100	67,600	34,900	12,800	6,250	9,550
30	7,810	6,750	6,750	4,580	------	19,800	15,100	72,200	38,400	12,200	6,250	9,550
31	7,810	------	6,750	4,350	------	26,700	------	50,800	------	11,500	6,250	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	8,950	7,270	7,890	485,000
November	7,810	6,750	7,560	450,000
December	7,270	1,930	5,580	343,000
January	7,270	4,350	5,940	365,000
February	6,750	4,350	5,690	316,000
March	62,900	7,010	24,100	1,480,000
April	33,800	10,800	16,000	952,000
May	72,200	11,500	23,400	1,440,000
June	84,800	31,600	46,700	2,780,000
July	41,000	11,500	23,800	1,460,000
August	10,800	6,250	8,190	504,000
September	9,550	6,250	8,380	499,000
The year	84,800	1,930	15,300	11,100,000

Digitized by Google

TOWER CREEK AT TOWER FALLS, YELLOWSTONE NATIONAL PARK

LOCATION.—Staff gage a short distance above Tower Falls and bridge on highway leading to Camp Roosevelt, a quarter of a mile above junction with Yellowstone River, and 2 miles southeast of Camp Roosevelt.

DRAINAGE AREA.—51 square miles.

RECORDS AVAILABLE.—September, 1922, to September, 1929.

EXTREMES.—Maximum discharge during year, 284 second-feet June 15 (gage height, 5.33 feet); minimum (estimated), 15 second-feet Jan. 18–31.

1922–1929: Maximum discharge, 642 second-feet May 30, 1925 (gage height, 6.16 feet); minimum, that of Jan. 18–31, 1929. Probably not actual extremes.

REMARKS.—Records good June to September; others fair. No diversions or regulation.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	29	25					18	19	*109	188	*42	*28
2	29	25					18	19	125	*162	41	28
3	*29	25					18	19	*101	150	*40	28
4	29	25					18	*19	70	138	39	27
5	29	*25					17	19	80	*126	*38	*27
6	29	25					17	19	*101	118	38	27
7	29	25	22				17	18	132	110	*37	*27
8	28	25			16		17	18	*162	102	37	27
9	28	25		18			16	18	200	94	36	*27
10	28	24				17	16	*18	*193	*86	*36	27
11	28	24					16	20	*193	83	*33	*27
12	28	24					16	30	*241	79	32	27
13	*28	24					*16	40	248	*76	*31	27
14	28	*24					16	40	*255	70	31	*27
15	28						16	45	*284	*64	*31	27
16	29						16	45	275	64	31	*27
17	29						17	*44	*228	63	*31	28
18	*29						17	45	222	*63	*30	*28
19	29						17	50	*216	62	30	28
20	28					*17	18	60	199	*62	30	28
21	28					17	18	80	*182	*56	*30	*28
22	27	24	20		17	17	18	100	186	52	29	28
23	27					18	*18	120	191	*49	29	*28
24	26			15		18	18	150	195	*49	*28	29
25	*26					18	18	*172	200	48	28	30
26	26					19	18	120	*204	*48	*29	*31
27	26					19	18	80	216	*45	28	31
28	26					*19	18	60	229	*45	*28	*31
29	26				------	19	19	60	*241	44	28	30
30	26				------	19	19	75	215	*44	28	29
31	25	------			------	19	------	100	------	43	*28	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	29	25	27.7	0.543	0.63	1,700
November	------	------	24.3	.476	.53	1,450
December	------	------	20.9	.410	.47	1,290
January	------	------	16.6	.325	.37	1,020
February	------	------	16.5	.324	.34	916
March	------	------	17.5	.343	.40	1,080
April	19	16	17.3	.339	.38	1,030
May	172	18	55.5	1.09	1.26	3,410
June	284	------	190	3.73	4.16	11,300
July	188	43	80.1	1.57	1.81	4,930
August	42	28	32.5	.637	.73	2,000
September	31	27	28.1	.551	.61	1,670
The year	284	------	43.9	.861	11.69	31,800

* Gage read on these days; discharge estimated for other days.

Digitized by Google

LAMAR RIVER NEAR TOWER FALLS RANGER STATION, YELLOWSTONE NATIONAL PARK

LOCATION.—Water-stage recorder half a mile north of Cooke City road, three-quarters of a mile above junction with Yellowstone River, and 2 miles northeast of Tower Falls ranger station.

DRAINAGE AREA.—640 square miles.

RECORDS AVAILABLE.—September, 1922, to September, 1929.

EXTREMES.—Maximum discharge during year, 8,080 second-feet June 15 (gage height, 7.56 feet); minimum (estimated), 125 second-feet Jan. 16–31.

1922–1929: Maximum discharge, 13,600 second-feet May 25, 1928 (gage height, 9.75 feet); minimum, 104 second-feet Apr. 20, 1924 (gage height, −0.08 foot).

REMARKS.—Records good except those for estimated periods, Nov. 17 to Apr. 26, Apr. 28–30, May 1–5, 7–10, and 12. No regulation or diversions above station. Attendant for recorder furnished by National Park Service.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	181	168						194	3,220	3,660	455	175
2	184	202						195	4,050	3,360	450	172
3	193	226						196	2,700	3,080	440	170
4	202	175						197	2,240	2,820	415	196
5	199	168						198	2,880	2,400	420	202
6	196	165						199	3,580	2,080	420	196
7	216	160						199	4,470	1,980	382	193
8	219	160		150			175	199	5,570	1,790	356	184
9	208	158						199	6,170	1,560	333	175
10	208	160						199	5,380	1,470	311	175
11	244	160						199	4,640	1,420	295	172
12	212	160						330	4,820	1,380	283	168
13	230	160						460	5,190	1,300	283	160
14	236	168						730	6,170	1,300	307	155
15	222	158			130			813	6,580	1,250	283	152
16	216	155	155			160		997	6,580	1,170	261	148
17	216							1,380	6,370	1,210	240	148
18	236	150						1,340	4,130	1,120	230	144
19	236							1,650	3,440	1,100	233	140
20	230							2,190	2,820	1,020	226	138
21	250						190	2,820	2,820	942	226	140
22	233							3,580	3,220	841	205	168
23	219			125				4,380	3,510	757	202	168
24	208							5,000	3,510	685	202	155
25	202	170						5,770	3,970	643	196	150
26	205							3,220	4,380	613	193	152
27	196						190	2,240	4,560	589	187	172
28	193						191	1,740	4,470	554	184	187
29	190				-------		192	1,650	4,820	521	187	190
30	175				-------		193	1,600	4,300	488	233	175
31	178	-------			-------		-------	2,300	-------	460	208	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	250	175	211	0.330	0.38	13,000
November	226	----------	167	.261	.29	9,940
December	----------	----------	155	.242	.28	9,530
January	----------	----------	137	.214	.25	8,420
February	----------	----------	130	.203	.21	7,220
March	----------	----------	160	.250	.29	9,840
April	----------	----------	183	.286	.32	10,900
May	5,770	194	1,500	2.34	2.70	92,200
June	6,580	2,240	4,350	6.80	7.59	259,000
July	3,660	460	1,410	2.20	2.54	86,700
August	455	184	285	.445	.51	17,500
September	202	138	167	.261	.29	9,940
The year	6,580	----------	737	1.15	15.65	534,000

Digitized by Google

GARDINER RIVER AT MAMMOTH HOTEL, YELLOWSTONE NATIONAL PARK

LOCATION.—Water-stage recorder a quarter of a mile downstream from footbridge on trail crossing leading to Mount Everts, three-eighths mile below inflow from Mammoth Hot Springs, and 0.9 mile northeast of Mammoth Hotel.

DRAINAGE AREA.—201 square miles.

RECORDS AVAILABLE.—September, 1922, to September, 1929.

EXTREMES.—Maximum discharge during year, 800 second-feet June 15 (gage height, 2.52 feet); minimum, 36 second-feet Mar. 15 (gage height, 0.61 foot).

1922–1929: Maximum discharge, 1,790 second-feet May 28, 1928 (gage height, 3.59 feet); minimum, 31 second-feet Apr. 7, 1928 (gage height, 0.55 foot). Lower flow may have occurred during extreme cold period, Dec. 17–26, 1924, when gage was not read.

REMARKS.—Records excellent. Discharge estimated Oct. 1–3, Jan. 20–24, and Feb. 7–11. No regulation or diversions above gage. Attendant for recorder furnished by National Park Service.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	126	105	96	85	74	78	74	114	416	480	156	105
2	127	98	83	87	76	76	70	112	450	430	161	102
3	128	102	80	87	76	76	70	126	385	398	145	105
4	129	109	66	87	76	76	76	126	338	376	145	105
5	129	112	70	72	76	76	78	119	359	346	147	109
6	129	112	74	89	72	72	70	107	403	314	139	112
7	124	100	76	83	70	74	68	114	460	302	134	112
8	122	107	85	83	70	74	66	112	524	283	129	107
9	119	102	89	91	72	74	70	112	595	264	124	105
10	122	105	96	85	72	76	68	112	614	250	122	105
11	116	100	100	85	74	76	68	107	577	243	116	107
12	116	100	96	85	74	74	68	145	559	236	114	102
13	126	107	91	85	76	74	68	223	595	240	114	102
14	124	105	98	85	74	70	68	246	674	264	112	100
15	124	102	91	85	74	70	70	207	709	232	109	98
16	124	93	91	85	72	72	76	246	723	223	109	98
17	134	96	85	83	76	74	83	240	688	246	107	98
18	136	70	85	85	76	70	85	226	577	223	109	96
19	124	93	76	74	76	70	87	254	524	223	109	96
20	122	105	87	70	74	72	89	283	450	207	105	96
21	129	98	87	72	74	76	89	318	435	194	102	109
22	119	98	85	65	72	72	87	372	440	185	100	112
23	114	98	80	65	74	72	87	440	450	176	100	107
24	109	91	80	70	76	72	80	559	450	167	100	107
25	109	98	87	74	76	74	78	660	475	164	98	105
26	109	96	87	74	76	74	80	480	524	161	100	112
27	107	100	91	74	74	76	87	394	518	156	100	114
28	109	91	89	72	74	78	107	330	502	153	102	109
29	107	74	87	74	------	80	132	294	541	147	116	105
30	107	98	89	74	------	74	129	322	530	147	132	100
31	109	------	85	70	------	66	------	326	------	147	109	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	136	107	120	0.597	0.69	7,380
November	112	70	98.8	.492	.55	5,880
December	100	66	85.9	.427	.49	5,280
January	91	65	79.2	.394	.45	4,870
February	76	70	74.1	.369	.38	4,120
March	80	66	73.7	.367	.42	4,530
April	132	66	80.9	.402	.45	4,810
May	660	107	252	1.25	1.44	15,500
June	723	338	516	2.57	2.87	30,700
July	480	147	244	1.21	1.40	15,000
August	161	98	118	.587	.68	7,260
September	114	96	105	.522	.58	6,250
The year	723	65	154	.766	10.40	112,000

Digitized by Google

SHIELDS RIVER AT CLYDE PARK, MONT.

LOCATION.—Wire gage in NW. ¼ sec. 33, T. 2 N., R. 9 E., at highway bridge one-fourth mile northwest of Clyde Park and 2 miles south of Brackett Creek.
DRAINAGE AREA.—544 square miles.
RECORDS AVAILABLE.—March, 1921, to September, 1923; April to September, 1929.
EXTREMES.—Maximum discharge during year, 1,040 second-feet May 25 (gage height, 3.21 feet); minimum, 16 second-feet Aug. 16 and 18 (gage height, 1.09 feet).

1921–1923, 1929: Maximum discharge, 1,880 second-feet May 26, 1923; minimum, 5.4 second-feet Aug. 9, 1921 (gage height, 1.06 feet).

REMARKS.—Records good. Discharge estimated Sept. 15–21. Numerous diversions above and below station.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	198	577	268	23	22	16	------	381	613	36	16	38
2	------	250	951	224	27	23	17	------	473	652	37	18	38
3	------	259	816	194	26	24	18	------	473	690	34	16	39
4	------	250	577	186	27	27	19	------	507	652	36	18	39
5	------	241	507	179	24	29	20	------	541	577	34	19	40
6	------	219	507	139	22	31	21	------	613	473	34	19	40
7	------	219	507	153	21	31	22	------	690	442	32	18	40
8	------	228	541	113	21	31	23	------	816	410	34	19	43
9	------	219	577	126	22	33	24	------	906	381	34	19	37
10	------	215	577	85	23	34	25	------	1,040	336	32	19	37
11	------	232	577	57	20	33	26	------	732	326	30	18	43
12	------	259	652	50	19	34	27	194	652	326	29	17	47
13	------	381	613	47	20	36	28	310	577	304	27	18	50
14	------	352	577	50	19	37	29	299	473	290	26	19	37
15	------	352	613	43	18	37	30	194	381	276	26	19	40
							31	------	410	------	24	18	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 27–30	310	194	249	1,980
May	1,040	198	437	26,900
June	951	276	531	31,600
July	268	24	78.0	4,800
August	27	16	20.1	1,240
September	50	22	35.7	2,120
The period				68,600

Digitized by Google

BOULDER RIVER NEAR CONTACT, MONT.

LOCATION.—Staff gage in SE. ¼ sec. 14, T. 3 S., R. 12 E., at Buffrey ranch, 8 miles south of McLeod, 4 miles from Contact, and 2½ miles below the Boulder Falls.

DRAINAGE AREA.—236 square miles.

RECORDS AVAILABLE.—May, 1910, to September, 1916; April to August, 1929; discontinued.

EXTREMES.—Maximum discharge during year, 3,170 second-feet June 14 and 15 (gage height, 5.60 feet); minimum, 68 second-feet Apr. 27 (gage height, 1.02 feet).

1910–1916, 1929: Maximum discharge, 4,750 second-feet June 27, 1916 (gage height, 8.4 feet old datum); minimum, 20 second-feet Nov. 22–24, 1914, and Mar. 21–24, 1915.

REMARKS.—Records good except those for June 18–20, July 4, 9–11, 13–28, and July 30 to Aug. 20, which are estimated. No diversions.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Day	Apr.	May	June	July	Aug.
1	-------	90	887	2,190	324	16	-------	215	2,810	923	197
2	-------	92	1,320	2,030	315	17	-------	284	2,720	879	189
3	-------	94	1,030	1,870	306	18	-------	305	2,340	835	181
4	-------	86	853	1,680	297	19	-------	376	1,950	791	173
5	-------	90	957	1,480	288	20	-------	482	1,560	747	165
6	-------	82	1,320	1,250	279	21	-------	721	1,180	703	157
7	-------	78	1,550	1,320	270	22	-------	957	1,320	659	148
8	-------	78	2,030	1,100	261	23	-------	1,180	1,400	615	145
9	-------	88	2,280	1,100	253	24	-------	1,630	1,400	571	140
10	-------	84	2,280	1,100	245	25	-------	2,190	1,630	527	140
11	-------	78	1,870	1,100	237	26	-------	1,250	1,710	483	137
12	-------	94	1,550	1,100	229	27	68	957	2,110	439	137
13	-------	137	1,950	1,060	221	28	78	753	2,110	395	137
14	-------	197	2,810	1,010	213	29	82	567	2,450	351	160
15	-------	215	2,810	967	205	30	92	538	2,450	342	186
						31	-------	658	-------	333	160

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 27-30	92	78	80.0	635
May	2,190	78	472	29,000
June	2,810	853	1,820	108,000
July	2,190	333	966	59,400
August	324	137	210	12,900
The period	-------	-------	-------	210,000

Digitized by Google

STILLWATER RIVER NEAR NYE, MONT.

LOCATION.—Chain gage in SE. ¼ sec. 32, T. 5 S., R. 15 E., at Beartooth ranch, 1,000 feet below mouth of Woodbine Creek and 8 miles south of Nye.

RECORDS AVAILABLE.—May to September, 1929. May, 1926, to September, 1927, at site 1,000 feet above Woodbine Creek.

EXTREMES.—Maximum discharge during year, 2,930 second-feet June 17 (gage height, 6.37 feet); minimum, 98 second-feet Sept. 19.

1926–27, 1929: Maximum discharge, 6,520 second-feet June 27, 1927 (gage height, 6.75 feet, old datum); minimum, 20 second-feet Feb. 28, 1926.

REMARKS.—Records good prior to Aug. 20 and fair thereafter. No diversions.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1	------	870	2,100	373	190	16	190	2,580	915	226	112
2	------	1,360	1,810	396	190	17	226	2,580	1,010	226	105
3	------	825	1,950	373	190	18	240	1,290	870	226	105
4	------	627	1,810	373	180	19	290	960	915	226	98
5	------	664	1,360	396	161	20	350	740	825	226	105
6	------	960	1,010	350	152	21	501	780	740	226	105
7	------	1,360	1,120	330	144	22	825	870	627	213	112
8	------	1,810	870	309	144	23	1,290	1,010	561	213	112
9	------	2,100	700	290	136	24	1,950	1,060	501	202	112
10	------	1,620	700	272	128	25	2,410	1,420	501	202	105
11	------	1,480	825	256	128	26	1,420	1,810	501	202	105
12	112	1,360	915	256	120	27	740	1,810	474	202	112
13	128	1,680	825	240	120	28	531	2,100	421	202	105
14	144	2,410	960	226	112	29	474	2,750	396	190	105
15	170	2,580	915	226	112	30	421	2,580	373	190	105
						31	561	------	373	190	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 12–31	2,410	112	649	25,700
June	2,750	627	1,530	91,000
July	2,100	373	899	55,300
August	396	190	259	15,900
September	190	98	127	7,560
The period				195,000

Digitized by Google

CLARK FORK BELOW CRANDALL CREEK, WYO.

LOCATION.—Water-stage recorder in sec. 1, T. 56 N., R. 106 W., 2 miles below mouth of Crandall Creek.
DRAINAGE AREA.—401 square miles.
RECORDS AVAILABLE.—August and September, 1929.
REMARKS.—Records excellent. No diversions above station.

Daily and monthly discharge, in second-feet, 1929

Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1		259	11	428	153	21	338	146
2		268	12	405	146	22	320	158
3		281	13	396	141	23	307	158
4		276	14	387	133	24	298	151
5		238	15	378	131	25	285	144
6		223	16	360	131	26	276	153
7		208	17	356	128	27	272	185
8		194	18	351	126	28	268	194
9	459	175	19	347	126	29	268	169
10	450	166	20	338	135	30	294	153
						31	264	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
August 9–31	459	264	341	15,600
September	281	126	175	10,400
The period				25,900

Digitized by Google

CLARK FORK AT CHANCE, MONT.

LOCATION.—Staff gage in NW. ¼ NW. ¼ sec. 32, T. 9 S., R. 22 E., at highway bridge at Chance, just above mouth of Sand Coulee and half a mile north of the Wyoming-Montana State line.

RECORDS AVAILABLE.—July, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 5,870 second-feet June 15 (gage height, 4.75 feet); minimum, 109 second-feet Apr. 10 and 13 (gage height, 0.70 foot).

1921–1929: Maximum discharge, 10,900 second-feet May 26, 1928 (gage height, 6.5 feet); minimum, 72 second-feet Mar. 19, 1927 (gage height, 0.50 foot).

REMARKS.—Records good. Discharge estimated because of ice Dec. 2–6. Observations discontinued Dec. 23 to Mar. 16. Numerous diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	313	268	190		149	410	2,870	4,620	970	443
2	298	243	190		160	376	3,930	4,380	920	436
3	278	264	190		226	359	3,280	4,380	870	436
4	268	318	190		318	383	2,680	3,930	920	443
5	268	313	190		335	313	2,870	3,710	1,020	443
6	268	308	190		264	318	2,870	3,070	970	443
7	293	308	190		197	341	3,490	2,680	822	443
8	313	278	190		155	293	3,710	2,500	775	480
9	293	313	190		146	318	3,930	2,020	685	443
10	278	324	197		133	376	4,870	2,020	642	443
11	341	268	212		128	308	4,380	2,170	685	443
12	353	268	212		133	353	4,150	2,170	685	443
13	318	268	194		128	730	4,150	2,500	600	376
14	318	273	190		128	1,460	5,370	2,330	559	318
15	330	251	190		160	1,260	5,620	2,500	518	293
16	376	247	175		152	1,330	5,620	2,500	480	255
17	376	251	163	190	204	1,460	5,620	2,500	480	230
18	364	208	152	187	247	1,590	4,620	2,330	480	222
19	353	201	172	190	247	1,730	3,490	2,680	518	222
20	353	222	160	175	268	2,170	2,680	2,500	480	219
21	364	268	133	178	318	2,680	2,500	2,170	480	215
22	353	234	144	175	278	3,070	2,870	2,020	480	226
23	359	226		152	288	3,710	3,280	1,870	480	222
24	318	226		166	264	4,380	3,280	1,660	436	230
25	293	219		155	222	4,620	3,930	1,660	416	247
26	318	226		138	204	4,620	3,930	1,660	423	293
27	318	197		157	247	3,490	4,620	1,520	436	283
28	268	190		219	330	2,680	4,620	1,330	436	288
29	268	146		288	518	2,330	5,370	1,260	436	293
30	268	190		219	685	2,020	5,120	1,020	436	293
31	226			149		2,500		920	443	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	376	226	313	19,200
November	324	146	250	14,900
December 1–22	212	133	182	7,900
March 17–31	288	138	182	5,420
April	685	128	241	14,300
May	4,620	293	1,680	100,000
June	5,620	2,500	3,990	237,000
July	4,620	920	2,400	148,000
August	1,020	416	612	37,600
September	480	215	335	19,900

Digitized by Google

CLARK FORK AT EDGAR, MONT.

LOCATION.—Wire gage in SW. ¼ sec. 24, T. 4 S., R. 23 E., at highway bridge half a mile east of Edgar. Datum of gage changed June 8.
RECORDS AVAILABLE.—July, 1921, to September, 1929.
EXTREMES.—Maximum discharge during year, 5,630 second-feet June 16 (gage height, 6.92 feet); minimum, 84 second-feet Mar. 9 (gage height, 1.85 feet). 1921–1929: Maximum discharge, 10,600 second-feet May 26, 1928 (gage height, 8.25 feet); minimum, that of Mar. 9, 1929.
REMARKS.—Records good. Observations discontinued Dec. 4 to Mar. 7. Numerous diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	390	390	304	-------	278	605	2,260	4,540	720	471
2	390	390	230	-------	278	422	3,070	4,200	720	471
3	390	422	186	-------	304	455	3,430	4,040	755	471
4	390	455	-------	-------	422	455	2,730	3,880	755	499
5	390	455	-------	-------	491	455	2,260	3,720	790	558
6	378	455	-------	-------	390	455	2,730	3,880	790	558
7	378	455	-------	-------	304	422	2,730	2,850	755	589
8	378	390	-------	186	278	455	3,270	2,850	620	528
9	378	390	-------	84	254	390	3,420	2,450	652	528
10	378	390	-------	166	254	455	3,570	2,320	589	499
11	455	378	-------	360	230	455	3,570	2,190	558	471
12	384	331	-------	566	230	390	3,420	2,320	528	471
13	360	343	-------	360	230	422	3,570	2,320	471	443
14	390	422	-------	605	230	685	4,200	2,320	443	499
15	422	422	-------	685	230	1,280	5,260	2,450	416	416
16	422	390	-------	331	230	945	5,630	2,450	390	416
17	455	378	-------	455	278	1,400	5,260	2,320	390	390
18	455	390	-------	491	304	1,400	4,370	2,320	443	365
19	455	390	-------	455	331	1,460	3,420	2,320	471	365
20	527	390	-------	455	360	1,830	2,710	2,320	443	365
21	527	390	-------	254	390	2,110	2,320	2,320	443	365
22	491	390	-------	254	390	2,410	2,450	1,950	416	390
23	455	390	-------	230	390	3,250	2,710	1,620	416	390
24	455	390	-------	230	527	3,800	2,850	1,510	416	390
25	390	390	-------	278	455	4,590	3,130	1,230	416	416
26	390	390	-------	230	360	4,990	3,570	1,060	416	443
27	422	390	-------	254	331	3,800	4,200	1,140	416	416
28	390	390	-------	390	331	2,730	4,370	1,060	416	471
29	390	390	-------	685	422	2,110	4,720	1,020	416	499
30	390	390	-------	491	566	1,970	5,260	862	416	499
31	390	-------	-------	331	-------	1,970	-------	755	416	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	527	360	415	25,500
November	455	331	398	23,700
March 8–31	685	84	368	17,500
April	566	230	335	20,000
May	4,990	390	1,570	96,500
June	5,630	2,260	3,550	211,000
July	4,540	755	2,340	144,000
August	790	390	526	32,300
September	589	365	455	27,000

Digitized by Google

SUNLIGHT CREEK NEAR PAINTER, WYO.

LOCATION.—Water-stage recorder in sec. 16, T. 55 N., R. 105 W., 1 mile east of Painter.
DRAINAGE AREA.—139 square miles.
RECORDS AVAILABLE.—August and September, 1929.
REMARKS.—Records excellent. Minor diversion for irrigation above station.

Daily and monthly discharge, in second-feet, 1929

Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1		100	11		80	21	98	65
2		98	12		76	22	96	66
3		106	13		73	23	94	66
4		113	14		71	24	94	66
5		110	15		71	25	94	66
6		107	16	100	67	26	94	72
7		107	17	106	65	27	106	80
8		100	18	108	64	28	103	86
9		90	19	106	64	29	104	78
10		85	20	101	64	30	112	72
						31	104	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
August 16–31	112	94	101	3,200
September	113	64	80.9	4,810
The period				8,010

Digitized by Google

WIND RIVER AT RIVERTON, WYO.

LOCATION.—Chain gage in sec. 2, T. 1 S., R. 4 E., three-quarters of a mile east of Riverton. Zero of gage is 4,844.38 feet above mean sea level. Gage was moved 500 feet upstream on Apr. 26, 1929.

DRAINAGE AREA.—2,320 square miles.

RECORDS AVAILABLE.—May, 1911, to September, 1927; October, 1928, to September 1929. May, 1906, to November, 1908, at Walkers Ferry, 1 mile upstream.

EXTREMES.—Maximum discharge during year, 4,730 second-feet May 25 (gage height, 6.0 feet); minimum occurred during winter.

1906–1908, 1911–1927, 1928–29: Maximum discharge, 12,300 second-feet June 14, 1906; minimum, 170 second-feet Dec. 16, 1926.

REMARKS.—Records good. Discharge not determined Dec. 6 to Apr. 25. Diversions for irrigation above station. Slight regulation owing to operation of Pilot Butte Canal which diverts water 30 miles above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Apr.	May	June	July	Aug.	Sept.
1	500	455	370		393	1,720	3,280	1,180	1,060
2	500	432	318		393	2,180	3,140	1,120	1,120
3	500	410	270		375	2,640	2,970	1,380	1,180
4	500	410	270		360	1,860	2,890	1,510	1,380
5	500	455	270		360	1,720	2,720	1,440	1,440
6	500	455			360	2,480	2,320	1,440	1,440
7	500	455			345	3,140	2,020	1,380	1,310
8	500	455			360	3,560	1,860	1,440	1,180
9	500	455			375	3,560	1,510	1,310	1,060
10	500	455			375	3,830	1,440	1,180	940
11	500	478			393	3,480	1,310	1,030	835
12	500	478			411	2,890	1,310	888	785
13	550	478			433	2,400	1,380	785	735
14	550	500			455	3,650	1,380	785	690
15	605	500			505	3,830	1,440	735	645
16	660	478			785	4,010	1,510	785	608
17	720	478			940	4,010	1,510	785	608
18	720	455			1,060	3,740	1,510	888	570
19	720	410			1,120	2,720	1,860	888	538
20	660	390			1,440	2,020	2,020	888	505
21	605	390			2,020	1,720	2,020	888	538
22	550	390			2,320	2,020	2,020	888	608
23	500	410			2,890	2,160	1,860	888	608
24	455	410			3,400	2,240	1,790	888	690
25	410	410			4,730	2,320	1,720	888	735
26	352	410		455	3,830	2,400	1,580	888	785
27	410	410		455	3,140	2,560	1,440	888	735
28	455	410		505	2,320	2,800	1,380	888	735
29	500	390		455	1,860	3,110	1,380	998	735
30	455	432		411	1,580	3,140	1,310	1,060	735
31	455				1,310		1,180	998	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	720	352	527	32,400
November	500	390	438	26,100
December 1–5	370	270	300	2,980
April 26–30	505	411	456	4,520
May	4,730	345	1,310	80,600
June	4,010	1,720	2,800	167,000
July	3,280	1,180	1,840	113,000
August	1,510	735	1,030	63,300
September	1,440	505	851	50,600

Digitized by Google

BIG HORN RIVER AT THERMOPOLIS, WYO.

LOCATION.—Chain gage in sec. 36, T. 43 N., R. 95 W., at Thermopolis. Zero of gage is 4,304.80 feet above mean sea level.

DRAINAGE AREA.—8,080 square miles.

RECORDS AVAILABLE.—May, 1900, to December, 1905; June, 1910, to September, 1929.

EXTREMES.—Maximum discharge during year, 14,000 second-feet Mar. 11 (gage height, 9.25 feet); minimum, 420 second-feet Feb. 14 (gage height, 0.34 foot). 1900–1905, 1910–1929: Maximum discharge, 29,800 second-feet July 24, 1923 (gage height, 16.2 feet); minimum, 180 second-feet Apr. 5, 1904 (gage height, 0.2 foot).

REMARKS.—Records good except those for estimated periods, Jan. 27 to Feb. 13 and Feb. 15–24, which are fair. Practically no diversions between mouth of Wind River and Thermopolis.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	762	850	549	549		635	1,560	1,460	3,870	4,760	1,550	1,270
2	790	820	526	517		656	1,230	1,400	4,220	4,760	1,450	1,320
3	762	762	458	496	450	740	1,070	1,180	4,940	4,580	1,400	1,320
4	762	693	480	488		1,020	1,470	1,160	4,760	4,220	1,450	1,230
5	762	790	480	480		1,270	1,770	1,190	4,040	4,220	1,550	1,360
6	762	820	488	501		1,350	1,320	1,260	3,870	3,550	1,550	1,660
7	762	882	423	530		1,490	1,460	1,300	4,580	3,250	1,450	1,400
8	762	915	513	522	430	3,570	1,430	1,180	5,500	2,970	1,550	1,450
9	735	735	583	488		6,350	1,060	1,140	5,680	2,830	1,550	1,550
10	762	850	568	484		11,100	922	1,160	6,420	2,690	1,450	1,450
11	762	790	656	496		13,600	882	1,160	6,790	2,270	1,320	1,450
12	790	820	614	530	420	11,400	870	1,250	6,420	2,050	1,190	1,450
13	915	820	661	535		3,550	838	1,300	6,790	2,050	1,190	1,450
14	1,050	820	666	526		1,000	820	1,730	6,980	1,890	1,020	1,320
15	1,160	820	677	522		1,160	762	2,190	6,790	2,010	948	1,270
16	1,160	820	625	568		1,340	730	2,540	6,980	2,010	915	1,320
17	1,190	820	599	568	430	1,250	810	2,600	7,530	2,010	980	1,320
18	1,190	762	599	540		1,270	1,070	2,550	7,900	2,010	980	1,270
19	1,190	672	599	544		1,250	1,350	2,490	6,420	2,010	1,050	1,190
20	1,190	564	578	600		1,650	1,570	2,520	4,580	1,890	1,080	1,050
21	1,190	583	483	578		1,320	810	2,620	3,550	2,140	1,080	934
22	1,160	583	614	573	450	876	1,430	2,760	2,970	2,140	1,120	850
23	1,080	666	651	559		1,110	3,500	2,870	3,870	2,140	1,160	850
24	1,020	762	564	530		1,060	4,960	2,830	3,870	2,140	1,120	915
25	882	790	559	505	458	1,210	3,400	2,870	3,870	2,010	1,160	980
26	850	790	568	461	461	1,090	3,420	2,970	3,870	1,890	1,120	1,050
27	790	762	530		554	1,010	3,030	3,170	4,040	1,770	1,120	1,120
28	790	762	535		604	1,110	2,030	3,310	4,400	1,770	1,120	1,120
29	850	708	549	440	-------	2,060	1,570	3,900	4,220	1,660	1,120	1,160
30	820	609	559		-------	1,320	1,490	3,880	3,110	1,550	1,160	1,230
31	850	-------	568		-------	1,740	-------	3,690	-------	1,550	1,230	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,190	735	919	56,500
November	915	564	761	45,300
December	677	423	568	34,900
January	609	440	513	31,500
February	604	420	448	24,900
March	13,600	635	2,570	158,000
April	4,960	730	1,620	96,400
May	3,900	1,140	2,180	134,000
June	7,900	2,970	5,090	303,000
July	4,760	1,550	2,540	156,000
August	1,550	915	1,230	75,600
September	1,660	850	1,240	73,800
The year	13,600	420	1,640	1,190,000

Digitized by Google

BIG HORN RIVER AT KANE, WYO.

LOCATION.—Chain gage in sec. 4, T. 56 N., R. 93 W., half a mile east of Kane. Zero of gage is 3,610.23 feet above mean sea level.
DRAINAGE AREA.—15,900 square miles.
RECORDS AVAILABLE.—August, 1928, to September, 1929.
EXTREMES.—Maximum discharge during year, 13,700 second-feet June 11 (gage height, 6.8 feet); minimum occurred during winter.
REMARKS.—Records good except those for estimated periods, which are fair. Daily discharge not determined Dec. 4 to Mar. 31. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	e1,280	1,600	1,230	------	------	------	4,540	3,000	6,070	6,540	1,530	1,110
2	e1,290	1,590	1,140	------	------	------	4,230	2,800	6,140	6,160	1,510	1,220
3	e1,300	1,530	1,080	------	------	------	4,520	2,550	10,400	5,960	1,440	1,340
4	e1,300	1,530	907	------	------	------	e4,520	2,410	8,560	5,290	1,420	1,440
5	e1,300	1,590	839	------	------	------	e4,520	2,340	7,610	4,950	1,420	1,580
6	e1,300	1,580	800	------	------	------	4,520	2,340	6,430	4,760	1,550	2,000
7	1,310	1,550	800	------	------	------	3,900	2,250	5,880	4,230	1,530	2,620
8	1,300	1,570	800	------	------	------	3,350	2,210	8,850	3,930	1,620	2,560
9	1,300	1,670	800	------	------	------	2,500	2,190	9,980	3,450	1,750	2,460
10	1,300	1,610	------	------	------	------	2,090	2,180	11,600	3,060	1,670	2,340
11	1,290	1,590	------	------	------	------	1,780	2,150	13,000	2,720	1,540	2,190
12	1,460	1,600	------	------	------	------	1,630	2,180	10,000	2,370	1,500	2,120
13	1,630	1,590	------	------	------	------	1,580	2,370	8,820	2,310	1,350	2,000
14	1,980	1,620	------	------	------	------	1,580	3,120	8,370	2,220	1,270	1,880
15	2,410	1,660	------	------	784	------	1,440	4,170	8,540	2,250	1,160	1,800
16	2,180	1,640	------	------	------	------	1,400	4,700	17,980	2,250	935	1,750
17	2,100	1,580	------	------	------	------	1,540	5,370	10,700	2,330	852	1,710
18	1,900	1,510	------	879	------	------	1,700	5,850	11,300	2,280	846	1,620
19	1,960	1,440	------	------	------	------	2,270	6,250	1,500	2,420	820	1,540
20	1,840	1,430	------	------	------	------	3,810	6,450	7,940	2,800	788	1,470
21	1,860	1,470	------	------	------	------	2,320	6,740	7,240	2,560	794	1,420
22	1,880	1,510	------	------	------	------	1,940	7,240	5,220	2,370	788	1,430
23	1,770	1,550	------	------	------	------	2,190	8,560	5,910	2,650	788	1,530
24	1,770	1,570	------	------	------	------	2,300	9,950	4,260	2,470	788	1,470
25	1,790	1,570	------	------	------	2,760	2,860	11,000	5,240	2,260	900	1,600
26	1,660	1,570	------	------	------	------	2,890	12,800	5,390	2,150	988	1,630
27	1,610	1,550	------	------	------	------	2,790	13,100	5,630	1,950	965	1,720
28	1,550	1,470	------	------	------	------	2,660	11,800	5,880	1,760	950	1,700
29	1,480	1,400	------	------	------	------	2,760	9,700	5,920	1,730	1,010	1,680
30	1,580	1,320	------	------	------	------	2,830	7,660	6,030	1,630	1,020	1,780
31	1,600	------	------	------	------	------	------	6,250	------	1,600	1,140	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2,410	1,280	1,620	99,600
November	1,670	1,320	1,550	92,200
December	------	------	e 975	60,000
January	------	------	e 880	54,100
February	------	------	e 770	42,800
March	------	------	e 5,150	317,000
April	4,540	1,400	2,770	165,000
May	13,100	2,150	5,540	341,000
June	13,000	4,910	7,880	469,000
July	6,540	1,600	3,080	189,000
August	1,750	788	1,180	72,600
September	2,620	1,110	1,760	105,000
The year	13,100	------	2,770	2,010,000

e Estimated.

Digitized by Google

BIG HORN RIVER NEAR HARDIN, MONT.

LOCATION.—Chain gage in N.W. ¼ sec. 19, T. 1 S., R. 34 E., at highway bridge on Crow Indian Reservation, half a mile above Little Horn River and 2 miles northeast of Hardin.

DRAINAGE AREA.—20,700 square miles.

RECORDS AVAILABLE.—June, 1904, to May, 1925; August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 45,900 second-feet Mar. 11 (gage height, 11.1 feet); minimum, less than 915 second-feet during January. 1904–1925, 1928–29: Maximum discharge, that of Mar. 11, 1929; minimum, 516 second-feet July 15–18, 1919 (gage height, 2.28 feet).

REMARKS.—Records good except those for period of ice effect, Nov. 28 to Mar. 5, which are fair. Numerous diversions. Some storage on tributaries.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,330	2,510					6,470	3,550	9,600	14,500	2,880	1,980
2	2,330	2,510					3,940	3,740	10,600	14,500	3,040	2,080
3	2,330	2,510				2,520	3,550	3,740	13,300	12,700	3,200	2,190
4	2,330	2,510					3,370	3,550	14,500	12,200	3,040	2,190
5	2,330	2,510					3,940	3,370	12,700	11,600	3,040	2,310
6	2,330	2,510	1,780	1,860	1,380	30,800	4,830	3,200	10,600	10,600	2,880	2,730
7	2,330	2,330				16,400	4,360	3,370	10,100	9,150	2,880	3,040
8	2,330	2,330				13,300	3,940	3,200	12,700	8,290	2,880	3,940
9	2,330	2,510				12,200	3,740	3,370	15,100	7,150	2,880	3,550
10	2,160	2,510				17,000	3,040	3,200	16,400	6,160	2,880	3,370
11	2,160	2,330				33,100	2,880	3,200	18,300	5,590	2,730	3,370
12	2,330	2,330				33,900	2,580	3,200	19,000	5,870	2,730	3,200
13	2,330	2,330				33,100	2,580	3,200	17,000	4,360	2,580	2,880
14	2,330	2,330				12,200	2,580	3,370	15,700	4,360	2,440	3,200
15	2,700	2,330	2,100	1,550	1,540	7,150	2,580	3,740	15,700	4,360	2,310	3,040
16	3,290	2,330				4,360	2,580	4,360	18,300	4,590	2,190	2,880
17	2,890	2,330				4,590	2,580	5,320	21,100	4,360	2,080	2,730
18	2,700	2,330				9,600	2,580	6,160	21,800	4,590	1,980	2,580
19	2,700	2,330				7,890	2,580	6,160	20,400	4,140	1,880	2,580
20	2,700	2,330				9,150	2,580	6,800	16,400	4,360	1,880	2,880
21	2,700	2,160				8,710	3,040	7,150	13,300	4,590	1,880	2,580
22	2,700	2,080				7,150	3,370	7,150	11,100	4,360	1,880	2,440
23	2,700	2,080				5,590	3,370	8,710	9,600	4,360	1,880	2,440
24	2,510	2,080				5,590	3,370	12,200	9,600	4,140	1,880	2,580
25	2,510	2,080				3,940	3,370	13,900	10,100	3,740	1,980	2,730
26	2,510	2,080	2,190	915	1,540	3,550	3,550	18,300	8,710	3,740	1,880	2,880
27	2,510	2,000				3,200	3,370	21,100	10,600	3,370	1,880	2,880
28	2,510					3,550	3,200	20,400	11,600	3,200	1,980	3,040
29	2,700	2,000				7,890	3,370	16,400	12,700	3,200	1,980	3,040
30	2,510					12,700	3,370	15,100	13,300	3,200	2,080	3,040
31	2,510					11,600	------	10,600	------	3,040	1,980	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	3,290	2,160	2,500	154,000
November	2,510	2,000	2,290	136,000
December	------	------	2,030	125,000
January	------	------	1,420	87,300
February	------	------	1,480	82,200
March	33,900	------	10,700	658,000
April	6,470	2,580	3,360	199,000
May	21,100	3,200	7,450	458,000
June	21,800	8,710	14,000	833,000
July	14,500	3,040	6,270	386,000
August	3,200	1,880	2,380	146,000
September	3,940	1,980	2,810	167,000
The year	33,900	------	4,740	3,430,000

Digitized by Google

DINWOODY CREEK NEAR BURRIS, WYO.

LOCATION.—Water-stage recorder in sec. 10, T. 5 N., R. 5 W., 6 miles northwest of Burris. Zero of gage is 6,195.39 feet above mean sea level.

DRAINAGE AREA.—114 square miles.

RECORDS AVAILABLE.—January to October, 1909; May, 1918, to September, 1929.

EXTREMES.—Maximum discharge during year, 767 second-feet July 20 (gage height, 2.98 feet); minimum occurred during winter.

1918–1929: Maximum discharge, 1,710 second-feet July 25, 1923 (gage height, 3.75 feet); minimum, 8 second-feet Apr. 17, 1922.

REMARKS.—Records good except those for estimated periods, which are fair. Daily discharge not determined Dec. 1–28 and Dec. 30 to Feb. 24. Natural regulation by Dinwoody Lake and other small lakes. Practically no diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	39		16		13	*14	21	109	511	472	511
2	65	38		*16		*13	13	*21	122	538	522	500
3	60	36		16		*13	*13	*20	178	522	568	478
4	60	32		*15		*12	13	20	183	533	610	462
5	59	29		15		12	*13	*20	175	522	621	418
6	56	32		*16		*12	13	*20	169	467	509	317
7	53	31		17		13	*14	20	189	429	550	254
8	52	27		*16		*14	15	19	232	403	506	202
9	50	28		16		15	*15	*20	296	376	445	169
10	53	25		*16		*14	*15	*21	303	418	413	148
11	64	23		*15		*13	*16	23	258	371	392	129
12	58	23		15		13	16	*28	222	356	392	111
13	49	26		*14		*13	*16	*34	212	397	397	103
14	50	24		*13		13	16	40	222	440	403	103
15	*49	23		13		*13	*16	*51	278	472	413	102
16	*48	*22		*14		*13	*16	62	340	500	420	96
17	*46	*20		16		*13	16	*65	403	533	445	89
18	*44	*19		*15		*13	*16	68	397	566	450	80
19	*42	*18		*13		13	*16	*56	282	621	472	75
20	41	*20		*11		*14	16	43	215	728	462	80
21	43	*22				15	*16	*45	175	683	434	89
22	41	23				*15	16	*47	166	660	424	*95
23	40	*23				15	*17	*50	186	621	403	*99
24	40	23				*15	*17	53	205	599	406	*102
25	40	*21			14	*14	*18	133	215	572	413	*92
26	39	*20		*11	*13	14	19	*216	229	582	413	*85
27	40	19			13	*15	21	299	278	599	456	*80
28	40	*18			*13	16	*21	236	335	550	450	75
29	38	17	16			*15	21	189	392	500	489	75
30	37	*17				*15	*21	150	434	489	538	72
31	38					15		124		484	538	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	65	37	48.4	2,980
November	39	17	24.6	1,460
December			*16.0	984
January	17	11	13.5	830
February			*14.0	778
March	16	12	13.7	842
April	21	13	16.2	964
May	299	19	71.4	4,390
June	434	109	246	14,600
July	728	356	517	31,800
August	621	392	469	28,800
September	511	72	176	10,500
The year	728		137	98,900

* Estimated.

Digitized by Google

DRY CREEK NEAR BURRIS, WYO.

LOCATION.—Water-stage recorder in sec. 12, T. 4 N., R. 5 W., 2 miles south of Burris.

DRAINAGE AREA.—73 square miles.

RECORDS AVAILABLE.—May, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 272 second-feet May 25 (gage height, 2.05 feet); minimum occurred during winter.

1921–1929: Maximum discharge, 1,100 second-feet June 12, 1921 (gage height, 3.9 feet); minimum, 2 second-feet Feb. 23, 1921.

REMARKS.—Records good. Discharge not determined Oct. 1 to Apr. 26. Small ditch diverts water for irrigation above station.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1		4.5	102	180	73	47	16		46	180	96	40	23
2		4.0	137	165	78	49	17		53	199	96	42	20
3		5.0	98	157	75	52	18		57	134	95	43	18
4		6.0	85	147	74	58	19		79	107	105	43	17
5		4.0	101	134	74	56	20		95	95	105	43	18
6		3.5	134	115	69	56	21		111	98	102	42	18
7		2.9	145	104	64	52	22		116	119	95	40	23
8		3.0	157	92	60	47	23		128	121	88	40	27
9		6.0	163	79	56	41	24		170	111	85	41	27
10		9.8	132	73	51	37	25		222	119	85	41	27
11		9.8	126	73	47	34	26		149	137	86	41	30
12		14	121	81	44	30	27	2.1	111	147	82	40	30
13		24	121	87	42	27	28	2.6	93	153	76	42	24
14		39	149	91	42	24	29	6.0	80	165	70	43	23
15		42	172	93	40	23	30	13	78	178	67	45	20
							31		87		70	46	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 27–30	13	2.1	5.92	46.9
May	222	2.9	59.8	3,680
June	199	85	134	7,970
July	180	67	99.1	6,090
August	78	40	50.4	3,100
September	58	17	32.6	1,940
The period				22,800

Digitized by Google

WILLOW CREEK NEAR CROWHEART, WYO.

LOCATION.—Water-stage recorder in sec. 20, T. 3 N., R. 4 W., 500 feet above diversion dam for Willow Creek ditch and 2 miles southwest of Crowheart.

RECORDS AVAILABLE.—May to October, 1909; May, 1921, to June, 1923; April, 1925, to September, 1929.

EXTREMES.—Maximum discharge during year, 151 second-feet June 17 (gage height, 2.15 feet) minimum occurred during winter.

1921–1923, 1925–1929: Maximum discharge, 750 second-feet July 26, 1923 (gage height, 4.50 feet, old datum); minimum, 7 second-feet Jan. 14, 1921.

REMARKS.—Records good except those for estimated period, Oct. 21–31, which are fair. Observations discontinued Nov. 1 to Apr. 30. No diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	May	June	July	Aug.	Sept.	Day	Oct.	May	June	July	Aug.	Sept.
1	11	5.5	42	51	11	8.2	16	11	6.7	117	19	9.8	9.0
2	11	5.9	58	42	11	7.8	17	11	6.7	107	18	10	8.6
3	11	6.2	46	39	11	9.0	18	12	7.0	68	18	9.8	7.8
4	11	6.4	46	38	11	9.0	19	12	7.0	60	24	9.8	7.8
5	11	6.4	59	33	10	8.6	20	12	7.8	53	18	9.4	7.8
6	11	6.4	79	28	10	9.8	21		9.0	65	17	9.0	8.6
7	11	6.4	85	28	11	10	22	12	9.8	79	15	9.0	9.4
8	11	6.4	101	25	11	10	23		19	65	14	9.0	9.0
9	11	6.4	113	21	11	9.8	24		36	60	13	9.4	8.6
10	11	6.4	104	21	11	9.8	25		78	65	12	9.0	9.0
11	11	6.4	93	21	9.4	9.4	26	11	54	65	12	8.6	10
12	12	6.4	84	20	9.8	8.6	27		34	61	12	8.2	9.4
13	12	6.4	89	20	9.8	9.0	28		29	61	12	8.6	9.4
14	12	6.4	110	20	9.8	9.0	29		24	56	11	8.6	9.4
15	11	6.4	114	18	9.0	9.4	30	10	22	56	11	7.8	9.4
							31		28	-------	11	7.8	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	12	10	11.2	689
May	78	5.5	15.2	935
June	117	42	75.4	4,490
July	51	11	21.4	1,320
August	11	7.8	9.66	594
September	10	7.8	9.03	537

Digitized by Google

BULL LAKE CREEK NEAR LENORE, WYO.

LOCATION.—Water-stage recorder in sec. 17, T. 3 N., R. 2 W., one-fourth mile above mouth and 14 miles southeast of Lenore.

DRAINAGE AREA.—132 square miles.

RECORDS AVAILABLE.—May, 1918, to September, 1929.

EXTREMES.—Maximum discharge during year, 1,430 second-feet June 17 (gage height, 5.89 feet); minimum occurred during winter.

1918–1929: Maximum discharge, 3,990 second-feet June 16, 1918 (gage height, 4.3 feet, old datum); minimum, 17.8 second-feet Feb. 1, 1919.

REMARKS.—Records excellent except those for estimated periods, which are fair. Flow naturally regulated by Bull Lake. Minor diversion for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	96	77					26	47	410	1,190	521	450
2	*100	*70					*27	47	493	1,210	539	445
3	*104	*50					*28	47	527	1,130	582	445
4	108	*40					*30	47	493	1,060	601	455
5	*106	50					*32	47	476	1,010	601	440
6	*100	47					*30	47	533	933	588	430
7	96	47		29			*29	47	627	793	575	390
8	*98	45					28	47	725	725	539	358
9	*98	45					*28	52	865	654	493	306
10	*98	45					*28	50	968	594	450	274
11	*100	44				26	*28	47	933	545	430	254
12	*98	43					*28	45	849	539	410	226
13	*98	43					*28	47	793	582	395	211
14	*96	43		27			*28	67	841	614	395	203
15	96	43					28	88	995	647	410	182
16	*94	42					*29	113	1,100	661	405	164
17	*92	42					*29	141	1,280	668	410	160
18	*90	42			23	24	*30	171	1,310	696	425	154
19	85	42					*30	203	995	725	420	147
20	*80	*40					*32	246	740	778	420	144
21	*80	*40					*33	328	608	778	425	138
22	74	*40					35	405	582	755	420	147
23	74	*42					40	466	647	725	400	164
24	67	*43	29				52	594	675	696	390	230
25	64	*42			28	27	50	825	703	682	385	246
26	64	40					45	995	748	668	390	262
27	59	*40					44	865	841	654	395	266
28	57	*38					43	675	950	634	400	258
29	57	*38					44	551	1,030	594	420	246
30	55	*37					47	445	1,120	557	420	226
31	57							405		533	440	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	108	55	85.2	5,240
November	77	37	44.7	2,660
December			*30	1,840
January			*26	1,600
February			*24	1,330
March			*25	1,540
April	52	26	33.6	2,000
May	995	45	265	16,300
June	1,310	410	795	47,300
July	1,210	533	743	45,700
August	601	385	455	28,000
September	455	138	266	15,800
The year	1,310		228	169,000

*Estimated.

Digitized by Google

LITTLE WIND RIVER NEAR FORT WASHAKIE, WYO.

LOCATION.—Water-stage recorder in sec. 1, T. 1 S., R. 2 W., above Ray ditch, 2½ miles southwest of Fort Washakie.
DRAINAGE AREA.—134 square miles.
RECORDS AVAILABLE.—May, 1921, to September, 1929.
EXTREMES.—Maximum discharge during year, 1,080 second-feet June 17 (gage height, 4.50 feet); minimum occurred during winter.
1921–1929: Maximum discharge, 5,220 second-feet July 9, 1926 (gage height, 7.59 feet); minimum, 14 second-feet Feb. 22, 1921.
REMARKS.—Records excellent except those for Oct. 14–19, Nov. 4–9, 17–21, 25–30, Apr. 1–12, 21–30, and May 1–3, which are estimated. Observations discontinued Dec. 1 to Mar. 31. Water diverted for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	46	34		53	267	504	143	81
2	46	33		51	362	444	144	79
3	46	32		49	246	393	146	85
4	46	32		47	228	368	143	92
5	50	33		38	330	330	137	96
6	44	33	18	34	420	282	130	108
7	45	34		33	393	267	125	103
8	44	35		41	496	246	118	100
9	44	36		56	583	220	112	93
10	44	36		54	496	204	104	90
11	44	34		57	456	208	97	86
12	44	32		67	382	218	92	83
13	44	34	18	102	452	222	83	78
14	44	33	18	135	596	225	67	75
15	44	33	17	123	655	232	59	74
16	45	33	17	137	755	240	58	72
17	45		20	171	860	240	59	70
18	46		25	167	476	255	59	66
19	46	30	28	193	358	232	59	62
20	46		29	230	306	225	62	59
21	46		26	264	337	213	61	63
22	44	34	22	225	460	200	61	90
23	40	32	23	321	460	187	61	112
24	37	33	25	390	444	179	65	110
25	37		30	524	456	175	68	104
26	36		40	390	496	173	65	112
27	35	30	50	306	520	169	63	106
28	36		62	249	508	162	66	97
29	35		58	206	516	150	72	92
30	34		55	195	520	144	81	86
31	36	-------	-------	215	-------	143	83	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	50	34	42.5	2,610
November	36	30	32.8	1,560
April	62	17	31.3	1,120
May	524	33	165	10,100
June	860	228	461	27,400
July	504	143	240	14,800
August	146	58	88.5	5,440
September	112	59	87.5	5,210

Digitized by Google

NORTH FORK OF LITTLE WIND RIVER AT FORT WASHAKIE, WYO.

LOCATION.—Water-stage recorder in sec. 33, T. 1 N., R. 1 W., at Fort Washakie, a quarter of a mile above mouth.
DRAINAGE AREA.—138 square miles.
RECORDS AVAILABLE.—May, 1921, to September, 1929.
EXTREMES.—Maximum discharge during year, 890 second-feet June 17 (gage height, 3.00 feet); minimum occurred during winter.
1921–1929: Maximum discharge, 2,640 second-feet July 9, 1926 (gage height, 4.85 feet); minimum, 16 second-feet Jan. 9, 1922.
REMARKS.—Records excellent except those for Oct. 7–19, Nov. 4–9, and 17–24, which are estimated. Observations discontinued Nov. 25 to May 10. Water diverted for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	May	June	July	Aug.	Sept.
1	26	31	-------	280	396	92	53
2	26	31	-------	336	376	90	56
3	25	35	-------	294	353	84	58
4	24	34	-------	270	325	82	64
5	24	34	-------	311	300	80	76
6	24	33	-------	364	276	78	86
7	26	33	-------	388	250	76	94
8	27	32	-------	445	231	72	98
9	29	32	-------	535	208	68	96
10	30	31	-------	525	186	65	92
11	32	30	51	480	168	62	86
12	33	29	57	418	158	58	82
13	35	30	94	404	158	55	78
14	36	29	150	490	155	52	76
15	38	27	168	594	155	48	74
16	40		158	677	152	46	68
17	41		173	818	150	46	65
18	43		160	616	150	48	61
19	44		170	455	158	47	58
20	46		189	360	155	50	55
21	46		208	332	143	51	55
22	42		181	353	143	46	57
23	40	25	240	372	152	46	57
24	39		287	364	145	48	60
25	39		455	372	118	47	62
26	37		470	388	127	46	74
27	35		388	400	120	46	78
28	32		318	414	111	47	80
29	32		273	409	102	50	80
30	30		244	404	96	50	78
31	31		237	-------	92	51	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	46	24	33.9	2,080
November	35	-------	28.2	1,680
May 11-31	470	51	222	9,250
June	818	270	429	25,500
July	396	92	187	11,500
August	92	46	58.9	3,620
September	98	53	71.9	4,280

Digitized by Google

SOUTH FORK OF OWL CREEK NEAR THERMOPOLIS, WYO.[1]

LOCATION.—Staff gage in sec. 33, T. 9 N., R. 2 E., 26 miles northwest of Thermopolis. Red Creek enters just above station.
DRAINAGE AREA.—272 square miles.
RECORDS AVAILABLE.—July, 1921, to September, 1922; May to September, 1929.
EXTREMES.—Maximum discharge during year, 418 second-feet May 25 (gage height, 3.85 feet); minimum, 1.4 second-feet Aug. 17 (gage height, 0.72 foot).
1921–22, 1929: Maximum and minimum discharge, same as given above.
REMARKS.—Records good except those for May 31 to June 30, which are fair. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1	-------	162	58	13	3.6	16	142	219	40	2.4	16
2	-------	225	50	15	5.1	17	167	189	47	1.4	16
3	-------	121	50	12	10	18	142	101	50	3.6	19
4	-------	101	50	13	24	19	150	108	45	4.2	20
5	-------	114	55	12	25	20	167	74	45	3.6	18
6	-------	114	53	10	24	21	221	77	43	4.2	16
7	-------	118	47	8.8	26	22	241	79	49	3.6	13
8	-------	150	47	6.8	25	23	301	101	35	3.6	12
9	-------	255	34	7.6	24	24	330	95	30	3.6	3.0
10	-------	199	36	10	20	25	305	95	22	3.6	6.8
11	-------	142	35	6.8	18	26	140	95	22	3.6	7.6
12	-------	142	29	5.1	18	27	93	84	20	3.6	5.1
13	-------	157	35	4.2	20	28	67	90	12	3.6	4.2
14	-------	213	34	5.1	18	29	63	84	14	3.6	6.0
15	112	203	32	2.4	18	30	63	84	12	4.2	4.2
						31	114	-------	15	3.6	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 15–31	330	63	166	5,600
June	255	74	133	7,910
July	58	12	37.0	2,280
August	15	1.4	6.06	373
September	26	3.0	14.8	881
The period	------	------	------	17,000

[1] Formerly published as Owl Creek near Embar, Wyo.

Digitized by Google

GREYBULL RIVER AT MEETEETSE, WYO.

LOCATION.—Water-stage recorder in sec. 4, T. 48 N., R. 100 W., at Meeteetse. Zero of gage is 5,718.63 feet above mean sea level. Gage moved one-fourth mile downstream April 17, 1930.

DRAINAGE AREA.—690 square miles.

RECORDS AVAILABLE.—June to September, 1897; April to October, 1903; July, 1920, to September, 1929.

EXTREMES.—Maximum discharge during year, 4,000 second-feet June 6 (gage height, 6.37 feet); minimum occured during winter.

1920–1929: Maximum discharge, 6,350 second-feet July 9, 1926; minimum, 63 second-feet Mar. 4, 1922.

REMARKS.—Records fair. Discharge estimated Oct. 14–31, Apr. 16, Aug. 12–19, and Sept. 9–14. Observations discontinued Nov. 1 to Apr. 14. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Apr.	May	June	July	Aug.	Sept.
1	287	--------	172	2,500	1,260	328	162
2	287	--------	172	2,820	1,160	344	135
3	287	--------	205	3,140	1,210	344	125
4	287	--------	225	3,500	1,140	295	120
5	287	--------	220	3,610	873	290	114
6	291	--------	185	3,680	698	280	117
7	287	--------	190	3,460	810	290	114
8	287	--------	161	3,170	559	280	108
9	287	--------	215	2,400	430	245	108
10	287	--------	275	2,080	439	231	107
11	287	--------	231	1,610	422	226	107
12	307	--------	316	1,580	439	224	110
13	344	--------	641	1,690	430	222	150
14	300	--------	980	2,290	493	220	175
15	275	125	980	2,400	520	218	207
16	250	150	1,140	2,400	484	216	202
17	225	175	1,380	1,980	493	214	194
18	200	168	1,190	1,040	493	211	186
19	175	154	1,410	894	502	209	182
20	170	147	834	794	466	207	178
21	168	140	1,440	831	484	202	178
22	168	138	2,190	936	466	194	216
23	168	154	2,510	999	415	186	216
24	165	122	2,540	957	408	182	202
25	165	118	2,990	1,140	430	182	190
26		122	3,200	1,310	484	182	198
27		140	2,360	1,360	448	178	198
28	160	195	2,020	1,360	355	194	190
29		287	1,780	1,440	316	194	186
30		281	1,640	1,420	316	212	176
31		--------	2,130	--------	338	186	--------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	344	160	232	14,300
April 15–30	287	118	164	5,210
May	3,200	161	1,160	71,300
June	3,680	794	1,960	117,000
July	1,260	316	574	35,300
August	344	178	232	14,300
September	216	107	162	9,640

Digitized by Google

SHOSHONE RIVER BELOW SHOSHONE RESERVOIR, WYO.

LOCATION.—Water-stage recorder in lot 76, T. 52 N., R. 102 W., 3½ miles below Shoshone Dam and 4½ miles west of Cody.
DRAINAGE AREA.—1,470 square miles.
RECORDS AVAILABLE.—January, 1921, to September, 1929.
REMARKS.—Complete records furnished by United States Bureau of Reclamation.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	674	483	395	320	286	261	317	387	2,990	6,280	1,860	743
2	663	473	391	320	286	261	317	404	3,040	5,790	1,860	743
3	648	473	387	320	283	261	317	400	3,040	5,450	1,820	743
4	642	450	382	317	283	261	317	409	3,010	5,210	1,770	743
5	632	445	378	317	279	261	317	413	2,960	4,680	1,670	743
6	622	445	373	313	279	261	317	459	2,960	4,060	1,540	743
7	611	445	369	313	276	261	317	684	2,990	3,720	1,410	743
8	606	445	365	313	276	265	317	674	3,110	3,390	1,310	743
9	596	441	361	309	272	272	317	684	3,470	2,920	1,220	743
10	586	441	361	309	272	276	317	690	4,320	3,680	1,150	743
11	576	445	357	309	272	286	317	690	5,330	3,100	1,120	733
12	571	445	357	309	272	286	317	684	5,640	2,170	1,090	722
13	566	445	357	286	268	286	317	706	5,330	2,270	1,070	711
14	556	445	353	309	268	286	317	754	5,030	2,340	1,040	700
15	556	441	353	301	268	294	317	810	5,640	2,400	1,020	690
16	556	441	361	301	268	294	317	867	6,220	2,430	999	684
17	556	436	361	309	265	298	313	950	6,350	2,450	987	674
18	551	427	353	301	265	298	317	999	5,610	2,410	950	669
19	551	422	344	301	265	301	324	1,060	4,740	2,410	938	663
20	551	418	336	301	265	301	320	1,170	4,060	2,330	914	658
21	546	413	336	301	265	301	317	1,300	3,710	2,210	903	658
22	541	413	332	298	265	305	320	2,170	3,730	2,110	873	642
23	536	409	328	298	265	305	328	2,730	3,910	2,000	862	642
24	532	409	332	294	265	305	328	2,990	3,810	1,890	844	637
25	679	409	332	294	261	305	340	3,500	3,380	1,800	821	632
26	838	409	328	294	261	305	336	4,060	4,350	1,770	810	627
27	833	409	324	290	261	305	340	4,000	5,100	1,740	793	622
28	815	409	324	290	261	313	344	3,500	5,610	1,700	782	622
29	799	404	328	290	------	313	357	3,200	6,120	1,650	765	622
30	787	395	324	290	------	317	369	3,080	6,420	1,610	760	622
31	684	------	324	290	------	317	------	3,010	------	1,880	754	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	838	532	628	38,600
November	483	395	433	25,800
December	395	324	352	21,600
January	320	286	303	18,600
February	286	261	270	15,000
March	317	261	289	17,800
April	369	313	324	19,300
May	4,060	387	1,530	94,100
June	6,420	2,960	4,400	262,000
July	6,280	1,610	2,900	178,000
August	1,860	754	1,120	68,900
September	743	622	689	41,000
The year	6,420	261	1,110	801,000

Digitized by Google

SHOSHONE RIVER AT BYRON, WYO.

LOCATION.—Chain gage in sec. 34, T. 56 N., R. 97 W., at Bryon.
DRAINAGE AREA.—2,300 square miles.
RECORDS AVAILABLE.—January to September, 1929.
EXTREMES.—Maximum discharge during year, 6,420 second-feet June 16, 30, and July 1 (gage height, 5.70 feet); minimum probably occurred during winter.
REMARKS.—Records good except those for Jan. 18 to Mar. 10, which were affected by ice. Water diverted for irrigation above station. Flow regulated at Shoshone Reservoir.

Daily and monthly discharge, in second-feet, 1929

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-------	267	808	438	294	2,260	6,180	1,280	277
2	-------			474	261	2,260	6,180	1,030	313
3	-------			516	267	2,440	5,700	938	298
4	-------			680	212	2,350	5,460	1,460	432
5	-------			641	235	2,260	4,760	983	641
6	-------	262	1,760	449	246	2,260	3,870	806	722
7	-------			449	432	2,260	3,870	763	722
8	-------			410	390	2,260	3,650	722	680
9	-------			400	382	2,440	3,030	602	641
10	-------			410	372	3,440	2,350	400	641
11	-------		2,170	410	390	3,650	4,760	523	680
12	-------		1,170	351	400	3,650	3,030	495	680
13	-------		1,070	443	395	3,650	1,830	488	722
14	-------		1,030	495	302	4,310	2,350	432	722
15	-------		806	421	368	5,220	3,030	368	566
16	-------	257	602	449	368	6,180	2,000	359	530
17	-------		602	449	382	5,940	2,000	351	502
18	362	285	763	454	351	5,940	1,910	320	449
19			680	481	372	4,990	1,910	355	454
20			641	523	395	4,310	1,910	313	432
21	312	449	602	680	421	3,870	1,750	309	421
22			566	410	602	3,650	1,750	267	415
23			566	474	1,600	3,870	1,340	270	438
24			530	481	1,830	4,090	1,070	261	894
25			488	488	2,540	3,440	963	261	763
26	267		566	460	3,650	3,870	894	267	763
27			502	449	3,440	4,530	806	270	722
28			680	404	3,230	5,460	806	280	763
29		-------	680	332	2,830	6,180	850	283	722
30		-------	641	336	2,540	6,420	763	290	722
31		-------	540	-------	2,350	-------	850	273	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
January 18–31	----------	----------	296	8,220
February	----------	----------	319	17,700
March	2,170	----------	925	56,900
April	680	322	462	27,500
May	3,650	212	1,080	63,300
June	6,400	2,260	3,920	233,000
July	6,180	763	2,630	162,000
August	1,460	261	517	31,800
September	894	277	591	35,200
The period	----------	----------	----------	636,000

Digitized by Google

LITTLE HORN RIVER NEAR CROW AGENCY, MONT.

LOCATION.—Water-stage recorder in NE. ¼ sec. 13, T. 3 S., R. 34 E., at Chicago, Burlington & Quincy Railroad bridge 2 miles south of Crow Agency and 14 miles above junction with Big Horn River.

DRAINAGE AREA.—1,190 square miles.

RECORDS AVAILABLE.—September, 1911, to September, 1924; August, 1928, to September, 1929. March, 1905, to June, 1906, at Crow Agency, 2 miles below present site. Crow Agency ditch diverts between the stations.

EXTREMES.—Maximum discharge during year, 3,080 second-feet Mar. 11 (gage height, 9.19 feet); minimum, 5 second-feet Jan. 23.

1905–6, 1911–1924, 1928–29: Maximum discharge, 8,200 second-feet July 23, 1923 (gage height, 14.0 feet); no flow July 28 to Aug. 6, 1921.

REMARKS.—Records fair. Stage-discharge relation affected by ice Dec. 5 to Mar. 6. Several diversions above station. Some regulation caused by headgate operations above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	193	201	129	228	74	185	560	905	965	621	153	36
2	189	181	141	185	89	185	462	785	1,140	582	153	31
3	185	141	181	165	89	107	1,180	755	1,460	550	157	52
4	181	181	197	165	107	145	1,270	725	1,500	522	153	80
5	185	165	205	165	107	250	1,800	677	1,370	500	149	86
6	185	189	205	89	185	1,460	1,400	719	1,270	506	153	103
7	193	189	205	59	125	1,630	725	701	1,340	544	161	118
8	193	185	205	145	145	2,150	516	725	1,530	671	169	121
9	197	181	205	165	125	1,870	506	707	1,630	660	165	125
10	185	181	205	185	107	2,520	472	755	1,660	582	153	125
11	185	181	185	165	89	3,080	450	588	1,600	528	141	118
12	218	177	185	165	107	1,730	425	533	1,400	516	125	129
13	223	177	185	178	125	935	456	560	1,370	506	103	129
14	218	181	185	145	148	506	511	572	1,430	484	93	111
15	218	181	165	125	185	560	638	638	1,460	462	83	103
16	214	181	165	107	185	566	689	725	1,530	370	80	93
17	218	197	145	89	185	544	785	719	1,460	355	83	93
18	223	181	165	107	205	538	755	725	1,240	330	68	86
19	214	169	165	145	228	935	755	755	1,120	310	50	83
20	232	197	165	74	125	695	755	785	1,020	286	59	74
21	246	228	185	34	107	572	707	815	965	268	54	68
22	259	223	185	16	185	660	755	875	935	264	59	83
23	228	218	185	5	228	755	845	965	875	241	62	100
24	241	228	185	21	228	604	785	1,080	815	223	65	129
25	223	236	165	10	205	478	713	1,240	785	201	56	125
26	214	254	185	10	205	365	935	1,500	785	193	59	125
27	201	272	205	10	185	701	965	1,630	755	181	65	137
28	197	272	185	28	185	905	845	1,370	719	169	59	133
29	197	272	185	21	-------	1,660	875	1,120	695	161	49	129
30	189	272	185	28	-------	1,180	965	995	654	161	44	125
31	189	-------	228	59	-------	845	-------	935	-------	153	36	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	259	181	208	12,800
November	272	141	203	12,100
December	228	129	188	11,300
January	228	5	99.8	6,140
February	228	74	152	8,440
March	3,080	107	946	58,200
April	1,800	425	783	46,600
May	1,630	533	857	52,700
June	1,660	654	1,180	70,200
July	621	153	390	24,000
August	169	36	98.9	6,080
September	137	31	102	6,070
The year	3,080	5	434	314,000

Digitized by Google

TONGUE RIVER NEAR DAYTON, WYO.

LOCATION.—Water-stage recorder in sec. 2, T. 56 N., R. 87 W., 3½ miles southwest of Dayton.

DRAINAGE AREA.—204 square miles.

RECORDS AVAILABLE.—November, 1918, to September, 1929; discontinued.

EXTREMES.—Maximum discharge during year, 2,160 second-feet June 1 (gage height, 5.30 feet); minimum occurred during winter.

1918–1929: Maximum discharge, 2,460 second-feet June 15, 1924 (gage height, 5.57 feet); minimum, 15 second-feet Nov. 29, 1919 (gage height, 1.00 foot).

REMARKS.—Records excellent except those for Dec. 11–13, Jan. 20 to Feb. 20, July 1, and 2, which are estimated. Minor diversion for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	136	86	77	70		60	62	127	1,360	580	188	105
2	136	105	68	75		58	63	117	1,760	540	185	107
3	132	75	53	70		56	66	119	1,280	495	182	124
4	132	103	53	68		60	80	115	1,130	490	182	124
5	129	103	65	66		60	82	115	1,020	461	176	122
6	127	94	77	75	50	60	70	112	1,090	441	197	124
7	124	75	82	61		60	68	107	1,480	432	200	119
8	124	94	90	70		59	63	97	1,520	470	191	117
9	122	80	84	66		60	65	115	1,720	441	171	119
10	122	101	84	68		62	68	134	1,520	379	162	117
11	129	97	83	65		63	63	129	1,480	360	157	115
12	117	92	83	71		58	65	152	1,200	344	149	115
13	139	103	83	71		53	60	212	1,130	340	144	112
14	154	105	82	68		52	65	295	1,320	340	142	107
15	136	97	82	63		56	68	323	1,360	312	139	107
16	139	75	82	63	55	58	71	285	1,400	299	136	105
17	134	105	80	70		60	79	387	1,440	285	134	103
18	134	75	75	68		60	82	409	1,090	278	134	99
19	127	79	71	60		60	86	475	980	282	136	97
20	129	90	77	58		60	97	586	868	278	134	94
21	129	103	77	56	62	59	97	784	854	269	129	94
22	122	92	77	54	63	59	94	1,020	812	259	124	119
23	136	92	77	52	63	60	115	1,320	791	243	122	132
24	124	86	75	50	63	59	86	1,600	712	243	122	122
25	119	88	73	48	60	59	75	1,960	692	228	122	117
26	122	88	73	48	60	56	79	1,440	738	221	127	115
27	110	92	73	48	59	59	92	1,020	705	215	122	112
28	115	80	75	50	60	65	105	819	640	208	119	110
29	105	68	75	50	-------	73	136	718	634	194	119	105
30	97	70	75	50	-------	65	149	757	622	185	115	101
31	103	-------	73	50	-------	62	-------	980	-------	188	107	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	154	97	126	7,750
November	105	68	89.8	5,340
December	90	53	75.9	4,670
January	75	48	61.7	3,790
February	63	-------	55.0	3,050
March	73	52	59.7	3,670
April	149	60	81.7	4,860
May	1,960	97	543	33,400
June	1,760	622	1,110	66,090
July	580	185	332	20,400
August	200	107	147	9,040
September	132	94	112	6,660
The year	1,960	-------	233	169,000

Digitized by Google

TONGUE RIVER NEAR DECKER, MONT.

LOCATION.—Chain gage in sec. 23, T. 9 S., R. 40 E., 1½ miles east of Decker and 2 miles above Deer Creek.

DRAINAGE AREA.—1,610 square miles.

RECORDS AVAILABLE.—April, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 7,220 second-feet June 2 (gage height, 8.25 feet); minimum probably occurred during winter.

1928–29: Maximum discharge, that of June 2, 1929; minimum probably occurred during winter.

REMARKS.—Records good except those for June 5 to July 21, and for estimated periods, Aug. 11–20, and Aug. 31 to Sept. 7, which are fair. Observations discontinued Oct. 1 to Mar. 31. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	221	1,300	3,460	1,380	192	130	16	575	1,520	3,570	903	162	217
2	478	1,130	6,300	1,320	178	126	17	702	1,490	3,470	818	157	229
3	726	996	6,020	1,180	162	127	18	928	1,540	3,750	718	152	234
4	1,330	1,160	4,890	1,120	152	132	19	928	1,830	2,990	776	149	248
5	1,720	1,400	5,310	1,150	152	151	20	988	2,060	2,280	582	147	221
6	1,380	1,270	3,780	1,100	162	160	21	1,130	2,480	1,860	522	146	225
7	920	1,210	4,160	1,190	152	168	22	1,120	2,880	1,460	485	145	225
8	750	1,270	4,550	1,200	159	178	23	1,050	3,380	1,570	363	145	200
9	598	1,220	4,400	1,060	168	189	24	1,220	4,060	1,680	335	141	248
10	530	1,200	4,020	920	176	200	25	1,500	4,550	1,510	288	143	277
11	433	1,120	4,540	810	190	217	26	1,330	5,300	1,780	254	137	363
12	419	1,060	4,250	810	188	217	27	1,520	4,820	1,600	248	139	328
13	492	1,020	3,570	742	183	208	28	1,450	3,680	1,450	221	139	321
14	478	1,160	3,600	784	176	221	29	1,340	3,080	1,450	200	139	307
15	508	1,390	3,890	852	167	221	30	1,390	3,030	1,330	213	134	335
							31	------	3,370	------	204	130	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April	1,720	221	938	55,800
May	5,300	996	2,160	133,000
June	6,300	1,330	3,290	196,000
July	1,330	200	734	45,100
August	192	130	157	9,650
September	363	126	221	13,200
The period	------	------	------	452,000

Digitized by Google

TONGUE RIVER NEAR MILES CITY, MONT.

LOCATION.—Staff gage on right abutment of Tongue and Yellowstone River Irrigation District Dam in NE. ¼ SW. ¼ sec. 29, T. 6 N., R. 48 E., 12 miles south of Miles City.

RECORDS AVAILABLE.—May to September, 1929.

EXTREMES.—Maximum discharge during period, 5,910 second-feet June 5 (gage height, 4.4 feet); minimum, 15 second-feet Aug. 30 and 31 (gage height, 0.80 foot).

REMARKS.—Records good. Water diverted for irrigation at diversion dam 50 miles upstream; by irrigation district canal 20 feet upstream from gage; and by minor ranch canals.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1		2,620	1,310	135	40	16		3,610	590	40	305
2		3,010	1,230	135	28	17		3,210	590	40	305
3		5,280	1,230	135	40	18		3,210	590	40	305
4		4,860	1,230	135	40	19	1,390	3,210	590	40	305
5		5,910	1,070	108	40	20	1,560	2,810	530	40	305
6		4,230	920	108	40	21	1,820	2,160	590	28	258
7		3,610	920	135	40	22	1,900	1,980	472	28	210
8		3,410	840	135	40	23	2,250	1,900	472	28	305
9		3,410	780	108	60	24	2,620	1,560	415	28	415
10		3,410	780	108	60	25	3,010	1,560	415	40	305
11		4,230	780	80	80	26	3,610	1,560	415	28	305
12		4,230	715	80	108	27	4,020	1,310	305	28	305
13		4,020	715	80	108	28	4,650	1,230	305	28	305
14		3,610	780	80	108	29	5,070	1,310	258	28	305
15		3,210	650	60	530	30	3,410	1,390	210	15	305
						31	2,810		210	15	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 19–31	5,070	1,390	2,930	75,600
June	5,910	1,230	3,040	181,000
July	1,310	210	675	41,500
August	135	15	68.3	4,200
September	530	28	197	11,700
The period				314,000

Digitized by Google

POWDER RIVER AT ARVADA, WYO.

LOCATION.—Chain gage in sec. 16, T. 54 N., R. 77 W., at Arvada, a quarter of a mile above Wildhorse Creek. Zero of gage is 3,623.8 feet above mean sea level.

DRAINAGE AREA.—6,050 square miles.

RECORDS AVAILABLE.—May, 1919, to September, 1929.

EXTREMES.—Maximum discharge during year, about 10,300 second-feet Mar. 7 (gage height, 8.80 feet); minimum, 2 second-feet Sept. 3 and 5 (gage height, 0.06 foot).

1919–1929: Maximum discharge, determined by slope-area method, about 95,000 second-feet (gage height, from high-water mark, 23.7 feet); river dry during parts of summers 1919, 1921, 1922, and 1923.

REMARKS.—Records good except those for Mar. 1–7, which are estimated. Observations discontinued Dec. 1 to Feb. 28. Diversions from tributaries entering above.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	73	161	200	1,630	1,540	2,050	437	52	3
2	77	151	400	1,060	1,620	1,900	725	42	3
3	77	128	600	1,570	1,030	2,670	622	40	2
4	86	128	1,000	4,840	965	3,200	405	30	3
5	93	188	2,000	6,000	965	2,050	347	28	2
6	86	210	3,000	3,280	1,600	1,730	321	31	4
7	75	221	3,500	1,650	2,140	1,660	369	55	7
8	79	198	4,610	939	1,560	2,020	632	492	10
9	79	198	4,400	642	1,040	1,760	437	2,180	12
10	81	204	4,290	548	758	1,570	369	618	40
11	110	188	7,230	453	681	1,560	340	265	70
12	142	171	4,400	445	660	1,480	308	166	68
13	128	176	2,080	429	632	1,570	271	81	59
14	133	171	494	521	651	1,480	3,600	57	58
15	182	188	308	477	1,400	1,330	437	47	47
16	198	188	503	469	1,790	1,130	2,060	37	48
17	171	210	1,230	477	1,950	939	1,200	31	48
18	160	204	469	503	1,980	888	557	29	52
19	182	182	530	469	2,290	852	383	24	52
20	151	182	494	548	2,270	816	283	18	52
21	166	166	622	575	2,160	747	221	17	52
22	160	142	1,060	1,240	2,270	703	232	16	59
23	151	193	850	1,070	2,500	670	193	14	57
24	182	176	613	1,220	2,800	736	193	12	61
25	151	188	437	2,180	2,780	714	156	10	59
26	166	176	269	1,870	2,900	651	124	9	75
27	151	193	429	2,160	3,920	613	99	6	99
28	171	221	769	1,700	3,600	539	86	7	539
29	182	57	4,210	1,390	2,660	485	75	6	453
30	151	57	7,410	1,460	4,510	530	62	5	321
31	142	-------	3,310	-------	2,910	-------	55	4	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	198	73	133	8,180
November	221	57	174	10,400
March	8,500	200	2,160	133,000
April	6,000	429	1,390	82,700
May	4,510	632	1,950	120,000
June	3,200	485	1,300	77,400
July	3,600	55	503	30,900
August	2,180	4	143	8,790
September	539	2	80.3	4,780

Digitized by Google

POWDER RIVER AT MOOREHEAD, MONT.

LOCATION.—Staff gage in sec. 5, T. 9 S., R. 48 E., at Moorhead.
RECORDS AVAILABLE.—May to September, 1929.
EXTREMES.—Maximum discharge during period, 8,610 second-feet June 3 (gage height, 7.90 feet); minimum, 43 second-feet Aug. 6–8 (gage height, 2.80 feet).
REMARKS.—Records good. Discharge estimated July 27–31 and Aug. 8. Observations discontinued Aug. 13 to Sept. 11 and Sept 15–26. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1	------	4,250	1,240	149	------	16	------	3,200	820	------	------
2	------	6,500	1,180	131	------	17	------	3,000	2,620	------	------
3	------	8,610	1,310	117	------	18	------	3,000	1,240	------	------
4	------	6,500	1,180	117	------	19	------	2,620	820	------	------
5	------	5,120	1,050	77	------	20	------	2,080	675	------	------
6	------	6,500	930	43	------	21	------	1,910	630	------	------
7	------	5,810	930	43	------	22	------	1,680	545	------	------
8	------	5,120	820	43	------	23	4,460	1,600	505	------	------
9	------	4,680	930	3,000	------	24	5,120	1,680	430	------	------
10	------	4,680	770	1,120	------	25	5,580	1,600	317	------	------
11	------	4,250	675	675	------	26	6,960	1,450	242	------	------
12	------	4,250	588	415	317	27	6,730	1,380	226	------	317
13	------	3,410	505	------	329	28	5,810	1,310	211	------	299
14	------	3,410	430	------	305	29	4,900	1,240	195	------	930
15	------	3,410	1,680	------	------	30	4,900	1,120	180	------	630
						31	6,500	------	164	------	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 23–31	6,960	4,460	5,660	101,000
June	8,610	1,120	3,510	209,000
July	2,620	164	775	47,700
August 1–12	3,000	43	494	11,800

Digitized by Google

POWDER RIVER NEAR MIZPAH, MONT.

LOCATION.—Wire gage near center of sec. 30, T. 6 N., R. 52 E., at highway bridge 2 miles southeast of Mizpah and 36 miles southeast of Miles City.
RECORDS AVAILABLE.—August, 1928, to September, 1929.
EXTREMES.—Maximum discharge during year, 14,700 second-feet Mar. 12 (gage height, 8.9 feet); minimum, 12 second-feet Sept. 5 (gage height, 2.04 feet). 1928–29: Maximum and minimum discharge, same as given above.
REMARKS.—Records good. Observations discontinued Dec. 5 to Mar. 6. No sizable diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	223	344	188	-------	6,920	2,500	10,200	1,150	121	31
2	196	283	103	-------	5,230	2,610	6,920	1,550	91	29
3	196	294	97	-------	4,450	2,830	6,050	1,150	97	21
4	196	294	66	-------	4,970	2,390	8,400	1,250	86	17
5	196	344	34	-------	6,050	2,080	6,920	825	76	12
6	196	331	-------	-------	11,100	1,660	4,800	762	50	21
7	196	331	-------	7,210	9,900	1,660	6,630	762	81	27
8	196	344	-------	10,800	6,920	2,500	4,450	1,250	68	29
9	196	370	-------	9,900	3,730	2,830	4,970	975	58	37
10	196	398	-------	8,700	3,050	2,500	5,230	900	40	42
11	196	412	-------	12,000	2,500	1,450	4,970	900	825	46
12	196	419	-------	14,700	1,860	1,250	4,450	524	762	40
13	214	398	-------	12,300	1,350	1,250	4,450	524	490	58
14	257	319	-------	6,920	1,350	1,150	3,960	524	344	103
15	306	331	-------	4,200	1,350	1,150	3,730	442	262	172
16	294	442	-------	2,830	1,350	1,450	3,730	2,390	196	180
17	283	442	-------	2,280	1,250	2,280	3,500	4,710	124	1,350
18	241	458	-------	2,080	1,250	5,500	3,050	900	121	515
19	244	474	-------	3,500	1,150	5,500	3,270	2,080	115	156
20	356	412	-------	4,450	1,150	3,500	2,830	1,150	97	149
21	426	384	-------	5,770	1,250	3,500	2,390	762	86	900
22	426	384	-------	6,630	1,150	3,270	2,180	596	76	135
23	337	344	-------	6,340	1,250	4,200	2,080	474	58	1,350
24	412	331	-------	5,230	1,450	4,200	1,970	490	76	180
25	370	306	-------	4,200	1,760	4,710	1,970	458	50	180
26	344	319	-------	3,050	2,080	8,700	1,970	426	46	176
27	344	331	-------	3,160	3,270	6,630	1,760	273	37	172
28	344	412	-------	3,270	3,050	7,500	1,550	262	46	180
29	319	306	-------	3,960	3,500	9,900	1,550	205	40	180
30	344	283	-------	9,300	2,830	9,000	1,250	172	42	205
31	370	-------	-------	11,100	-------	8,100	-------	132	43	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	426	196	281	17,300
November	474	283	361	21,500
December 1–5	188	34	97.6	968
March 7–31	14,700	2,080	6,560	325,000
April	11,100	1,150	3,280	195,000
May	9,900	1,150	3,800	234,000
June	10,200	1,250	4,140	246,000
July	4,710	132	934	57,400
August	825	37	152	9,350
September	1,350	12	223	13,300

Digitized by Google

MIDDLE FORK OF POWDER RIVER AT KAYCEE, WYO.

LOCATION.—Chain gage in sec. 1, T. 43 N., R. 82 W., at Kaycee.
DRAINAGE AREA.—647 square miles.
RECORDS AVAILABLE.—May, 1911, to October, 1912; May to September, 1929.
EXTREMES.—Maximum discharge during year, 1,610 second-feet June 2 (gage height, 6.42 feet); minimum, 46 second-feet Aug. 23–26 (gage height, 0.62 foot).

1911–12, 1929: Maximum discharge, that of June 2, 1929; minimum probably occurred during winter.

REMARKS.—Records good except those for June 9–15, July 24, Sept. 6 and 14, which are estimated. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1		1,160	172	75	54	16		450	151	51	87
2		1,410	172	72	51	17		425	130	51	86
3		1,100	155	70	60	18		372	122	51	84
4		880	146	67	71	19		350	117	50	84
5		880	146	67	63	20		330	106	49	84
6		850	138	65	78	21		300	106	49	82
7		880	138	75	92	22		280	106	48	90
8		790	146	70	86	23		280	98	46	88
9		710	122	62	82	24		270	90	46	87
10		645	119	60	82	25		260	81	46	90
11		635	116	55	82	26		240	86	46	103
12		610	109	55	82	27	1,090	200	82	50	98
13		550	106	55	78	28	1,030	200	81	58	98
14		490	104	52	84	29	1,380	190	81	57	90
15		460	230	52	90	30	970	181	80	55	87
						31	970		75	55	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 27–31	1,380	970	1,090	10,800
June	1,410	181	546	32,500
July	230	75	121	7,440
August	75	46	56.8	3,490
September	103	51	82.3	4,900
The period				59,100

Digitized by Google

RED FORK NEAR BARNUM, WYO.

LOCATION.—Chain gage in sec. 34, T. 43 N., R. 83 W., 6 miles east of Barnum.
DRAINAGE AREA.—149 square miles.
RECORDS AVAILABLE.—May to September, 1929.
EXTREMES.—Maximum discharge during year, 754 second-feet May 25 (gage height, 3.57 feet); minimum, 12 second-feet Aug. 24 (gage height, 0.45 foot).
REMARKS.—Records good. Small diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1	-------	322	67	24	16	16	-------	126	37	13	24
2	-------	350	71	19	16	17	-------	124	34	14	24
3	-------	285	66	18	19	18	-------	115	37	13	24
4	-------	248	63	19	19	19	-------	115	35	13	24
5	-------	235	63	17	19	20	-------	106	29	13	24
6	-------	272	64	16	24	21	-------	105	44	12	23
7	-------	222	63	18	23	22	-------	102	43	13	24
8	-------	210	66	19	23	23	-------	98	40	15	22
9	-------	185	66	17	23	24	485	95	32	14	15
10	-------	175	58	19	21	25	660	88	34	13	16
11	-------	185	55	15	21	26	625	82	31	15	18
12	-------	175	45	14	24	27	380	67	29	20	16
13	-------	145	39	14	24	28	335	60	27	22	15
14	-------	137	43	13	24	29	350	58	27	24	15
15	-------	132	44	13	23	30	298	56	24	23	15
						31	285	-------	23	19	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 24–31	660	285	427	6,770
June	350	56	156	9,280
July	71	23	45.1	2,770
August	24	12	16.5	1,010
September	24	15	20.6	1,230
The period	-------	-------	-------	21,100

Digitized by Google

NORTH FORK OF POWDER RIVER NEAR KAYCEE, WYO.

LOCATION.—Chain gage in sec. 13, T. 44 N., R. 82 W., 5 miles north of Kaycee.
DRAINAGE AREA.—244 square miles.
RECORDS AVAILABLE.—May to November, 1911; May to September, 1929.
EXTREMES.—Maximum discharge during year, 617 second-feet May 26 (gage height, 2.77 feet); minimum, 2.2 second-feet Aug. 1, 22, and 23 (gage height, 0.42 foot).

1911, 1929: Maximum discharge, that of May 26, 1929; minimum, 0.92 second-foot July 28 and 29, 1911.

REMARKS.—Records good. Water diverted for irrigation above station.

Daily and monthly discharge in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1		325	33	2.3	4.8	16		125	16	2.5	23
2		551	30	3.9	5.2	17		120	14	2.7	23
3		300	26	4.0	8.4	18		104	15	2.5	23
4		270	24	2.3	11	19		89	32	2.3	24
5		240	23	2.8	13	20		76	17	2.6	24
6		285	23	3.5	21	21		65	16	2.3	24
7		384	23	3.5	25	22		45	14	2.2	26
8		310	13	3.3	23	23		50	11	2.2	33
9		310	26	2.5	23	24		49	9.2	2.3	36
10		290	24	2.4	26	25		52	7.2	2.4	50
11		295	20	2.4	26	26	587	46	6.6	2.6	50
12		270	18	2.4	23	27	346	43	5.6	2.8	34
13		174	17	2.5	23	28	231	41	3.2	2.8	34
14		154	17	2.7	20	29	373	37	3.0	3.2	34
15		142	17	2.4	21	30	213	36	3.0	3.4	31
						31	204		2.8	4.0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 26-31	587	204	326	3,880
June	551	36	176	10,500
July	33	2.8	16.8	1,030
August	4.0	2.2	2.76	170
September	50	4.8	24.7	1,470
The period				17,000

Digitized by Google

CRAZY WOMAN CREEK NEAR BUFFALO, WYO.

LOCATION.—Chain gage in sec. 36, T. 48 N., R. 81 W., 21 miles southeast of Buffalo.
DRAINAGE AREA.—464 square miles.
RECORDS AVAILABLE.—May to September, 1929.
EXTREMES.—Maximum discharge during year, about 2,640 second-feet June 2 (gage height, 5.36 feet); minimum, 8.8 second-feet several days in August (gage height, 0.94 foot).
REMARKS.—Records good. Discharge estimated July 4, 21, 28, Aug. 11, 18, 25, Sept. 8, 15, 22, and 29. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1	------	630	88	10	11	16	------	414	21	10	21
2	------	1,880	82	9.4	11	17	------	370	19	10	22
3	------	1,200	68	8.8	10	18	------	320	17	10	21
4	------	714	61	10	11	19	------	270	22	10	21
5	------	623	55	10	13	20	------	235	32	10	21
6	------	623	49	10	17	21	------	205	22	9.6	18
7	------	805	49	10	19	22	------	225	14	9.2	20
8	------	714	53	10	20	23	------	270	13	9.2	23
9	------	604	60	11	22	24	------	245	13	8.8	24
10	------	571	56	10	21	25	------	185	12	8.8	26
11	------	571	38	9.8	21	26	------	170	11	8.8	29
12	------	662	30	9.6	25	27	------	134	10	9.2	34
13	------	521	26	9.0	23	28	------	114	9.8	10	37
14	------	437	27	9.2	22	29	------	108	9.6	12	33
15	------	398	24	10	22	30	618	91	9.8	10	29
						31	636	------	9.4	12	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
June	1,880	91	477	28,400
July	88	9.4	32.6	2,000
August	12	8.8	9.82	604
September	37	10	21.6	1,280
The period				32,300

Digitized by Google

CLEAR CREEK NEAR ARVADA, WYO.

LOCATION.—Chain gage in sec. 1, T. 56 N., R. 77 W., 16 miles north of Arvada.
DRAINAGE AREA.—1,110 square miles.
RECORDS AVAILABLE.—July, 1915, to April, 1919; April, 1928, to May, 1929.
EXTREMES.—Maximum discharge during year, 8,600 second-feet May 30 (gage height, from high-water mark, 11.0 feet); minimum probably occurred during winter.

1915–1919, 1928–29: Maximum discharge, that of May 30, 1929; minimum, 1 second-foot several days in September, 1916.

REMARKS.—Records good. Observations discontinued Dec. 1 to Mar. 10. Gage washed out May 26. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Mar.	Apr.	May	Day	Oct.	Nov.	Mar.	Apr.	May
1	115	141	-------	295	615	16	181	147	133	335	870
2	115	130	-------	335	490	17	162	141	130	355	995
3	120	117	-------	515	445	18	153	130	120	468	810
4	120	80	-------	1,350	515	19	153	95	190	490	1,120
5	128	171	-------	810	565	20	159	105	580	490	1,410
6	120	153	-------	590	540	21	153	105	468	540	1,640
7	110	141	-------	468	445	22	153	130	695	540	1,960
8	105	147	-------	378	468	23	162	141	590	422	1,960
9	110	141	-------	335	422	24	159	136	315	695	2,440
10	105	136	-------	258	400	25	159	136	295	540	2,800
11	117	122	1,310	275	468	26	150	103	258	468	3,340
12	125	136	995	295	422	27	150		295	468	------
13	130	130	378	295	468	28	133	75	615	490	------
14	136	133	193	315	750	29	136		1,410	515	------
15	147	136	171	335	1,060	30	130		468	615	------
						31	136	-------	445	-------	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	181	105	136	8,360
November	171	----------	123	7,320
March 11–31	1,410	120	479	20,000
April	1,350	258	476	28,300
May 1–26	3,340	400	1,050	54,100

Digitized by Google

LITTLE MISSOURI RIVER BASIN

LITTLE MISSOURI RIVER NEAR ALZADA, MONT.

LOCATION.—Chain gage near southwest corner of T. 8 S., R. 60 E., at Walker ranch, 2 miles below mouth of Thompson Creek and 4 miles below Alzada.

DRAINAGE AREA.—780 square miles.

RECORDS AVAILABLE.—June, 1911, to September, 1925; August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 4,000 second-feet May 30 (gage height, 14.50 feet); minimum, 0.1 second-foot Oct. 17 (gage height, 2.04 feet).

1911-1925, 1928-29: Maximum discharge, 4,550 second-feet Apr. 6, 1912 (gage height, 15.3 feet); no flow at times.

REMARKS.—Records good. Discharge estimated because of ice Mar. 8-10. Observations discontinued Dec. 22 to Mar. 7. Some small diversions. Small storage in coulees.

Daily and monthly discharge, in second-feet, 1928-29

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.4	0.4	0.5	-------	1,950	72	3,050	16	5.1	5.1
2	.4	.4	.5	-------	1,060	62	1,340	16	4.5	.6
3	.4	.4	.5	-------	794	58	1,550	28	3.8	.6
4	.3	.4	.3	-------	1,000	56	1,340	30	10	.7
5	.4	.4	.5	-------	1,800	59	794	25	53	.7
6	.4	.5	.4	-------	2,460	86	424	23	71	.7
7	.5	1.3	.3	-------	3,350	72	456	83	82	.7
8	.5	.5	.5	424	1,980	63	900	77	63	.7
9	.7	.4	.3	262	552	76	234	52	21	.5
10	.7	.4	.3	488	290	59	102	46	20	.5
11	.2	.4	.4	1,680	248	113	72	29	9.4	.5
12	.3	.5	.4	1,980	248	65	62	24	7.0	.5
13	.3	.4	.5	1,570	154	53	51	20	5.7	.5
14	.4	.4	.5	1,440	154	43	43	18	7.0	.5
15	.3	.5	.5	922	209	63	40	13	5.1	.5
16	.2	.5	.4	276	221	42	36	13	3.2	.5
17	.2	.6	.4	186	262	35	31	424	.7	.5
18	.2	.6	.4	197	234	29	31	262	.6	.5
19	.2	.5	.4	154	209	28	27	36	.7	.5
20	.2	.5	.5	738	197	26	24	16	1.3	.5
21	.3	.5	.4	1,920	175	25	24	13	.6	.5
22	2.0	7.0	-------	2,300	144	25	15	13	.6	.4
23	1.3	3.8	-------	2,260	130	22	23	10	.6	.7
24	.7	.6	-------	2,460	290	21	23	9.4	.5	67
25	.5	.5	-------	1,660	520	20	20	8.6	.6	72
26	.4	.4	-------	1,060	393	1,310	19	7.8	.6	234
27	.4	.4	-------	876	262	2,780	19	7.8	.6	132
28	.4	.3	-------	1,420	118	2,740	17	6.4	.5	40
29	.4	.3	-------	1,980	93	3,000	17	6.4	.4	20
30	.3	.4	-------	2,620	76	3,650	17	5.7	.6	53
31	.3	-------	-------	2,780	-------	3,650	-------	6.4	9.4	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2.0	0.2	0.46	28.3
November	7.0	.3	.81	48.2
December 1-21	.5	.3	.42	17.5
March 8-31	2,780	154	1,320	62,800
April	3,350	76	652	38,800
May	3,650	20	594	36,500
June	3,050	15	360	21,400
July	424	5.7	43.4	2,670
August	82	.4	12.6	775
September	234	.4	21.2	1,260

49758—32——10

Digitized by Google

LITTLE MISSOURI RIVER AT MEDORA, N. DAK.

LOCATION.—Wire gage in NE. ¼ sec. 27, T. 140 N., R. 102 W., at highway bridge at Medora.

DRAINAGE AREA.—6,190 square miles.

RECORDS AVAILABLE.—May, 1903, to October, 1908; October, 1921, to September, 1924; August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 38,700 second-feet June 7 (gage height, 17.2 feet); minimum, 2.2 second-feet Jan. 8 (gage height, 2.46 feet). 1903-1908, 1921-1924, 1928-29: Maximum discharge, that of June 7, 1929; minimum, 2 second-feet Sept. 28, 1905 (gage height, 2.4 feet, old datum).

REMARKS.—Records good. Discharge estimated Oct. 17-22, Apr. 4, and Aug. 3-7. Observations discontinued Nov. 27 to Mar. 10. Small diversions for irrigation from headwater tributaries.

Daily and monthly discharge, in second-feet, 1928-29

Day	Oct.	Nov.	Jan.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	89	69			13,100	1,050	19,000	251	111	29
2	67	69			8,530	1,300	11,900	218	111	28
3	55	69			6,750	1,130	9,700	218	115	111
4	51	65			5,720	1,130	9,400	218	130	234
5	48	57			4,700	929	6,070	218	144	102
6	44	44			5,050	852	4,540	188	159	86
7	31	48			4,540	778	33,700	203	174	82
8	20	37	*2.2		4,380	778	14,100	286	188	62
9	20	31			4,090	674	5,050	286	134	52
10	20	28			3,690	674	3,690	251	134	50
11	20	30		1,130	4,090	642	3,690	188	90	39
12	20	36		3,200	3,320	610	4,870	174	94	31
13	34	36		3,690	2,760	550	2,550	158	72	29
14	20	30		2,550	2,140	522	2,240	163	56	29
15	20	24		3,090	1,950	580	1,390	174	52	24
16	27	19		3,090	1,760	550	1,300	368	56	33
17	31	17		2,550	1,760	550	1,130	286	72	34
18	35	16		3,320	1,660	778	968	251	78	31
19	39	16		4,380	1,660	852	742	188	72	28
20	43	67		4,700	1,570	778	674	234	62	24
21	47	109		5,440	1,570	610	550	346	56	29
22	59	109		6,990	1,570	550	522	218	56	24
23	71	34		6,520	1,480	522	493	155	47	36
24	94	61		11,900	1,390	466	440	174	47	34
25	160	34		12,200	1,390	416	416	188	50	47
26	174	27		9,700	1,220	929	391	251	44	36
27	174			6,520	1,220	5,650	326	188	33	78
28	146			7,480	1,130	6,520	305	144	31	111
29	119			12,200	1,050	9,400	368	124	33	56
30	109			13,500	1,050	27,300	251	160	31	75
31	89			11,900		28,800		115	29	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	174	20	63.7	3,920
November 1-26	109	16	45.5	2,350
March 11-31	13,500	1,130	6,470	269,000
April	13,100	1,050	3,210	191,000
May	28,800	416	3,120	192,000
June	33,700	251	4,690	279,000
July	368	115	212	13,000
August	188	29	82.6	5,080
September	234	24	55.5	3,300

* Result of discharge measurement.

Digitized by Google

KNIFE RIVER BASIN

KNIFE RIVER AT HAZEN, N. DAK.

LOCATION.—Wire gage in NE. ¼ sec. 19, T. 144 N., R. 86 W., at Hazen.
RECORDS AVAILABLE.—October, 1928, to September, 1929.
EXTREMES.—Maximum discharge during year, 845 second-feet June 3; maximum gage height, 13.82 feet Mar. 20, caused by ice; minimum discharge, 1.2 second-feet Aug. 27.
REMARKS.—Records good prior to Aug. 16 and poor thereafter. Discharge estimated Nov. 11–22. Observations discontinued Nov. 24 to Mar. 25 and May 5–31.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		26		680	34	755	28	12	7.4
2		44		486	39	800	26	11	8.0
3		44		305	39	845	21	12	7.4
4		39		215	41	305	19	12	5.0
5		29		165		215	18	12	5.0
6		28		165		155	16	11	5.6
7		38		155		110	24	12	5.9
8		47		205		100	22	13	3.5
9		31		185		100	21	12	2.6
10		30		135		100	20	11	3.8
11		30		110		175	18	11	5.3
12		29		92		345	21	10	4.7
13		29		78		215	13	15	5.3
14		28		69		285	9	15	5.9
15		28		47		215	14	12	12
16		27		47		165	16	6.5	2.3
17		27		49		135	17	6.5	1.4
18		26		51		195	15	5.9	7.7
19	25	26		56		165	17	5.9	6.5
20	26	25		51		51	14	5.3	6.5
21	27	25		51		45	245	2.6	5.9
22	27	24		49		38	42	3.8	16
23	26	24		47		37	25	5.6	3.5
24	27			46		31	20	5.0	3.5
25	26			44		28	19	5.0	5.9
26	26		474	42		28	17	2.0	8.4
27	27		429	41		31	15	1.2	8.4
28	24		315	36		28	13	6.8	17
29	26		429	39		28	13	8.0	6.5
30	26		418	35		26	12	5.0	7.1
31	27		548				12	5.0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October 19–31	27	24	26.1	673
November 1–23	47	24	30.6	1,400
March 26–31	548	315	436	5,190
April	680	35	124	7,380
May 1–4	41	34	38	301
June	845	26	192	11,400
July	245	9	25.9	1,590
August	15	1.2	8.42	518
September	17	1.4	6.47	385

Digitized by Google

HEART RIVER BASIN

HEART RIVER AT SUNNY, N. DAK.

LOCATION.—Chain gage in NE. ¼ sec. 25, T. 39 N., R. 82 W., at highway bridge 0.9 mile west of Sunny.

DRAINAGE AREA.—3,320 square miles.

RECORDS AVAILABLE.—April to September, 1924; March, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 2,750 second-feet June 3 (gage height, 10.56 feet); no flow Aug. 20.

1924, 1928–29: Maximum stage, 13.6 feet June 19, 1924 (discharge not determined); no flow Aug. 20, 1929.

REMARKS.—Records fair except those for period of ice effect, Nov. 30 to Mar. 18, which are poor. No diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8	16					2,330	103	1,930	88	27	2.1
2	8	24					1,380	103	2,690	76	24	2.1
3	6	32				e 30	1,080	96	2,690	70	19	2.1
4	6	32					870	96	e 2,000	67	19	7.0
5	6	40					615	88	e 1,310	65	18	7.0
6	8	58			e 8		615	82	615	63	18	6.1
7	8	58					570	82	438	61	16	6.1
8	4	49				e 25	661	76	358	58	21	6.1
9	4	24					570	76	253	65	18	5.2
10	e 6	24					481	88	253	63	15	5.2
11	8	24					397	82	253	56	12	5.2
12	16	24					304	76	753	48	10	5.2
13	8	24				e 200	222	70	e 800	46	10	8.0
14	8	24					238	70	847	41	10	8.0
15	8	24	e 25	e 10	e 10		222	70	988	41	10	8.0
16	8	32					222	65	1,080	39	10	7.0
17	8	32				e 500	e 208	61	1,490	37	10	6.1
18	8	32					193	63	800	33	9.0	5.2
19	16	32				1,710	166	63	548	32	1.6	5.2
20	e 16	32				2,510	166	61	397	30	0	4.4
21	e 16	32				1,990	142	61	286	30	4.4	4.4
22	16	32				2,100	142	58	253	29	4.4	4.4
23	16	40				1,280	142	56	222	33	3.5	6.1
24	24	58				1,080	142	56	180	24	3.5	8.0
25	24	58			e 20	894	132	56	142	18	2.6	10
26	16	49				894	121	58	121	12	2.6	13
27	32	40				847	112	76	96	11	2.6	16
28	32	32				1,040	103	63	142	11	2.6	13
29	32	32			-------	1,180	103	70	103	11	2.6	11
30	32	e 32			-------	2,330	103	397	96	10	2.1	10
31	24	-------			-------	2,390	-------	1,180	-------	10	2.1	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	32	4	13.9	855
November	58	16	34.7	2,060
December	----------	----------	25.0	1,540
January	----------	----------	10.0	615
February	----------	----------	12.1	672
March	2,510	----------	743	45,700
April	2,330	103	425	25,300
May	1,180	56	119	7,320
June	2,690	96	738	43,900
July	88	10	41.2	2,530
August	27	0	10.0	615
September	16	2.1	6.91	411
The year	2,690	0	182	132,000

e Estimated.

Digitized by Google

CANNONBALL RIVER BASIN

CANNONBALL RIVER NEAR TIMMER, N. DAK.

LOCATION.—Chain gage in NW. ¼ sec. 21, T. 133 N., R. 82 W., at boundary of former Standing Rock Indian Reservation, 4 miles southeast of Timmer and 4 miles above Dogtooth Creek.

DRAINAGE AREA.—3,650 square miles.

RECORDS AVAILABLE.—June, 1903, to November, 1908; October, 1921, to September, 1922; October, 1923, to September, 1924; March, 1928, to September, 1929. August, 1911, to September, 1918, at site 1 mile upstream.

EXTREMES.—Maximum discharge during year, 6,520 second-feet Mar. 18 (gage height, 11.1 feet); no flow Sept. 2, 3, 11, 12, 15, 16, and 19.

1903–1908, 1911–1918, 1921–22, 1923–24, 1928–29: Maximum discharge, that of Mar. 18, 1929; no flow during periods each year 1904–1908, 1913, and 1929.

REMARKS.—Records poor for October and November; others good. Observations discontinued Nov. 24 to Mar. 11. No diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov	Mar.	Apr.	May	June	July	Aug.	Sept.
1	21	4.2	-------	950	108	303	53	2.3	0.1
2	21	4.2	-------	1,340	86	620	48	163	0
3	21	4.2	-------	1,140	83	1,270	43	32	0
4	21	4.2	-------	832	73	1,410	39	100	.1
5	21	4.2	-------	620	67	1,140	34	51	.1
6	21	4.2	-------	1,010	61	722	32	30	.1
7	21	12	-------	620	59	573	39	19	.1
8	12	12	-------	573	53	373	34	23	.1
9	4.2	12	-------	409	51	271	30	18	.1
10	4.2	12	-------	337	59	227	28	11	.1
11	4.2	21	-------	271	83	618	26	8.8	0
12	4.2	21	2,400	241	59	1,010	23	8.8	0
13	4.2	21	1,480	213	51	1,270	21	6.2	.1
14	4.2	21	1,620	187	46	670	19	5.3	.1
15	4.2	21	1,270	175	51	428	18	6.5	0
16	4.2	12	2,590	163	59	670	16	4.7	0
17	4.2	12	5,380	163	46	573	14	3.1	.1
18	4.2	12	6,390	152	43	373	12	2.7	.1
19	4.2	12	5,120	140	39	271	11	1.9	0
20	4.2	21	4,880	130	41	213	10	1.3	.1
21	4.2	21	5,620	119	39	175	8.8	1.0	.1
22	21	12	4,750	108	39	140	7.7	.8	.1
23	12	12	3,460	100	37	119	6.5	.5	6.5
24	12	-------	2,030	93	34	104	5.9	.3	11
25	12	-------	1,700	90	32	97	5.3	.3	19
26	12	-------	1,480	83	34	93	4.7	.2	28
27	4.2	-------	1,550	80	48	73	4.1	.2	30
28	4.2	-------	3,010	77	46	67	3.5	.1	19
29	4.2	-------	2,030	73	41	64	3.1	.1	10
30	4.2	-------	1,700	93	37	59	3.1	.1	8.8
31	4.2	-------	1,140	-------	573	-------	2.7	.1	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	21	4.2	9.79	602
November 1–23	21	4.2	12.7	579
March 12–31	6,390	1,140	2,980	118,000
April	1,340	73	353	21,000
May	573	32	70.3	4,320
June	1,410	59	467	27,800
July	53	2.7	19.5	1,200
August	163	.1	16.2	996
September	30	0	4.46	265

Digitized by Google

GRAND RIVER BASIN

GRAND RIVER NEAR WAKPALA, S. DAK.

LOCATION.—Chain gage in sec. 26, T. 19 N., R. 29 E., 5 miles south of Wakpala.
DRAINAGE AREA.—5,640 square miles.
RECORDS AVAILABLE.—August, 1928, to September, 1929. September, 1911, to March, 1918, at point about 5 miles upstream.
EXTREMES.—Maximum discharge during year, 4,860 second-feet Mar. 14 (gage height, 10.3 feet); no flow Sept. 13.
1911–1918, 1928–29: Maximum discharge, 7,130 second-feet June 17 and 19, 1915; no flow Sept. 13, 1929.
REMARKS.—Records fair. Discharge estimated Nov. 26–30 and Mar. 10–12. Observations discontinued Dec. 1 to Mar. 9. No diversions.

Daily and monthly discharge, in second-feet, 1928–29.

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	122	45	-------	1,780	395	1,900	122	9.1	4.3
2	117	45	-------	1,540	350	2,200	122	11	3.3
3	112	45	-------	1,000	230	2,080	112	9.7	3.7
4	101	45	-------	900	210	1,100	110	9.1	9.2
5	90	52	-------	850	190	322	108	8.8	6.8
6	86	56	-------	850	181	350	97	7.3	4.3
7	83	45	-------	1,380	172	546	102	7.6	3.5
8	80	44	-------	1,050	154	1,050	100	8.8	2.5
9	74	42	-------	950	172	716	96	8.8	1.8
10	72	40	920	805	163	365	92	8.2	1.2
11	66	52	1,200	716	154	546	82	7.9	.7
12	63	55	3,000	673	130	466	79	8.5	.3
13	60	56	4,540	588	130	365	75	7.9	0
14	60	58	4,780	466	130	285	79	7.3	.1
15	60	60	4,060	588	130	336	78	6.5	.3
16	59	58	2,590	546	130	322	79	5.8	.5
17	58	56	2,940	526	138	309	76	4.8	.5
18	56	53	3,990	505	122	285	71	4.3	.9
19	53	53	3,990	466	122	274	42	3.3	1.4
20	55	56	3,430	395	138	252	42	1.9	1.3
21	56	53	3,710	285	130	263	41	.8	1.6
22	55	53	3,710	274	122	230	122	.6	3.3
23	53	51	3,850	263	130	200	181	1.4	4.8
24	51	47	3,640	322	122	297	75	3.1	5.5
25	49	47	2,590	673	130	172	54	2.9	6.2
26	47	46	2,020	760	122	154	44	2.5	7.3
27	45	45	1,160	526	112	146	31	2.2	8.2
28	45	45	1,380	505	102	146	24	3.9	7.6
29	45	45	3,360	252	309	138	22	5.2	73
30	45	45	2,940	336	1,660	130	19	4.3	181
31	45	-------	2,520	-------	2,020	-------	12	3.7	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	117	45	66.6	4,100
November	60	40	49.8	2,960
March 10–31	4,780	920	3,010	131,000
April	1,780	252	692	41,200
May	2,020	102	274	16,800
June	2,200	130	532	31,700
July	181	12	77.1	4,740
August	11	.6	5.72	352
September	181	0	11.4	678

Digitized by Google

MOREAU RIVER BASIN

MOREAU RIVER AT PROMISE, S. DAK.

LOCATION.—Chain gage in sec. 17, T. 16 N., R. 29 E., half a mile below Virgin Creek and three-quarters of a mile north of Promise.

DRAINAGE AREA.—5,220 square miles.

RECORDS AVAILABLE.—August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 8,760 second-feet Mar. 24 (gage height, 11.56 feet); no flow parts of August and September.

1928–29: Maximum discharge, 13,400 second-feet Sept. 17, 1928 (gage height, 14.6 feet); no flow parts of August and September, 1929.

REMARKS.—Records good except those for estimated periods, Oct. 1–6 and Nov. 24–30, which are fair. Observations discontinued Dec. 1 to Mar. 6. No diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	91	37	------	1,850	61	3,340	37	5.5	0
2	84	37	------	1,501	54	4,150	36	5.5	0
3	77	32	------	1,090	50	2,880	36	5.0	0
4	70	28	------	820	50	1,470	33	4.5	0
5	63	38	------	625	48	1,100	31	2.9	0
6	57	35	------	435	44	2,230	30	2.9	0
7	51	36	788	416	42	2,310	30	.5	0
8	47	35	697	530	39	1,410	31	.9	0
9	48	34	1,400	549	40	1,250	30	.5	0
10	47	36	1,420	663	40	956	29	.5	0
11	45	38	5,100	549	38	663	28	.4	0
12	44	38	5,660	380	38	464	31	.4	0
13	44	37	7,060	276	36	335	40	.4	0
14	42	38	7,340	326	31	270	58	.4	0
15	44	40	8,700	309	31	226	45	.3	0
16	44	37	2,200	260	34	187	43	.1	0
17	42	37	2,530	260	34	154	36	0	0
18	42	37	3,170	244	32	126	33	0	0
19	42	37	3,430	180	32	102	33	0	0
20	40	34	3,300	142	30	89	28	0	0
21	40	34	3,300	136	30	79	28	0	0
22	39	37	4,120	115	74	72	25	0	0
23	38	34	7,620	106	33	73	20	0	0
24	38	33	8,320	102	27	64	16	0	0
25	37	29	5,520	309	24	58	14	0	.1
26	37	27	2,440	115	31	55	13	0	.3
27	37	26	2,200	86	30	49	10	0	.2
28	37	22	4,120	74	35	45	8.8	0	.1
29	37	22	2,930	69	31	42	7.4	0	.1
30	37	22	2,360	65	3,340	40	5.5	0	0
31	37	------	2,280	------	3,220	------	5.5	0	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	91	37	47.7	2,930
November	40	22	33.6	2,000
March 7–31	8,320	697	3,720	185,000
April	1,850	65	420	25,000
May	3,340	24	248	15,200
June	4,150	40	810	48,200
July	58	5.5	27.4	1,680
August	5.5	0	.99	61
September	.3	0	.03	2

Digitized by Google

CHEYENNE RIVER BASIN

CHEYENNE RIVER AT EDGEMONT, S. DAK.

LOCATION.—Chain gage in sec. 36, T. 8 S., R. 2 E., at Edgemont, 600 feet above Cottonwood Creek. Zero of gage is 3,416.2 feet above mean sea level.

DRAINAGE AREA.—6,050 square miles.

RECORDS AVAILABLE.—June, 1903, to November, 1906; April, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, about 10,500 second-feet June 3 (gage height, 7.86 feet); no flow Jan. 5.

1928–29: Maximum and minimum discharge, same as given above. Maximum stage known, 12.0 feet, present datum, about May 1, 1922.

REMARKS.—Records fair. Daily discharge not determined Dec. 1 to Feb. 28. Minor diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	48	15			*150	1,600	396	1,600	79	25	110
2	58	27			*200	811	410	3,180	205	22	52
3	55	7			*300	619	363	3,760	108	18	38
4	32	7			*400	1,100	298	3,400	209	15	30
5	32	32	b0		*600	2,700	234	1,100	282	14	29
6	32	39			*800	3,590	213	710	522	366	43
7	32	25			1,080	2,960	262	536	399	92	49
8	32	27			811	1,570	310	406	333	1,460	53
9	27	30			760	780	260	392	205	333	43
10	30	22			1,130	518	234	346	128	140	32
11	27	22			899	418	194	287	96	106	32
12	27	22			1,720	337	167	246	63	63	32
13	20	22			1,500	303	146	233	46	49	29
14	18	25			637	292	121	229	121	49	25
15	22	25			292	325	108	200	1,680	35	25
16	10	18			194	320	92	168	2,080	30	25
17	10	15			216	343	85	160	1,080	22	25
18	10	7			220	379	79	152	637	24	27
19	10	*12			379	343	76	140	265	15	29
20	10	*20			525	379	63	128	214	13	29
21	10	*25			682	373	47	108	156	13	29
22	10	*25			1,100	355	41	98	117	9	25
23	10	*20			1,450	343	22	124	214	18	22
24	10	*24		b35	1,150	488	14	121	182	10	18
25	10	*22			691	465	12	110	117	6	27
26	10	*20			534	437	1,880	96	152	6	72
27	10	*17			458	411	3,080	86	108	6	420
28	7	*14			458	361	3,310	86	70	24	682
29	8	*12			628	273	3,220	79	57	160	518
30	8	*8			2,010	398	6,320	70	49	234	304
31	13				2,560		5,420		32	245	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	58	7	20.9	1,290
November	39	7	20.2	1,200
December			*5	307
January		0	*3	184
February			*50	2,780
March	2,560	150	791	48,600
April	2,590	292	788	46,900
May	6,320	12	906	55,700
June	3,760	70	785	46,700
July	2,030	32	319	19,600
August	1,460	6	117	7,190
September	682	18	95.4	5,680
The year	8,760	0	326	236,000

* Estimated. b Result of discharge measurement.

Digitized by Google

CHEYENNE RIVER NEAR WASTA, S. DAK.

LOCATION.—Chain gage in sec. 2, T. 1 N., R. 14 E., 3 miles east of Wasta. Zero of gage is 2,263.4 feet above mean sea level.

DRAINAGE AREA.—11,700 square miles.

RECORDS AVAILABLE.—August, 1914, to June, 1915; August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 16,800 second-feet June 2 (gage height, 8.0 feet); minimum occurred during winter.

1914–15, 1928–29: Maximum discharge, 34,200 second-feet June 13, 1915 (gage height, 12.5 feet); minimum, 56 second-feet Sept. 28 to Oct. 1, 1914.

REMARKS.—Records good except those for estimated periods, which are fair. Daily discharge not determined Dec. 3 to Jan. 31. Minor diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	194	130	193			*300	2,880	1,240	5,390	914	620	215
2	194	140	193			*300	2,740	1,240	16,500	775	557	207
3	179	146	------	------		*300	1,960	1,240	15,000	784	504	200
4	167	146	------	------		326	1,550	1,240	8,400	784	*485	211
5	160	186	------	------		290	1,370	1,240	4,700	1,360	*485	204
6	160	290	------	------		*1,000	2,020	1,240	4,510	1,430	*500	193
7	152	359	------	♭116		*2,000	3,460	1,250	4,060	1,490	*725	196
8	146	359	------	------	*100	2,320	3,840	1,670	3,970	1,420	*650	253
9	149	374	------	------		2,330	2,860	1,660	2,470	1,220	*700	467
10	146	390	------	------		2,130	1,340	1,640	2,430	1,180	*800	672
11	140	398	------	------		3,000	1,720	1,620	2,370	1,060	905	727
12	146	376	------	------		2,980	1,730	1,240	2,370	1,030	843	767
13	146	360	------	------		3,100	1,660	1,180	2,220	1,040	792	811
14	152	350	------	------		3,360	1,980	1,160	2,020	1,090	672	932
15	206	253	------	------		3,560	1,720	1,170	1,890	887	578	950
16	237	261	------	------		2,980	1,460	1,060	1,790	969	498	932
17	206	253	------	------		1,990	1,430	878	1,560	1,610	341	878
18	182	257	------	------	*125	1,800	1,330	818	1,490	1,900	257	826
19	171	245	------	------		1,150	1,250	852	1,420	1,340	241	743
20	175	237	------	------		1,140	1,090	843	1,430	1,580	241	650
21	182	226	------	------		1,140	1,010	775	1,400	1,340	233	680
22	186	218	------	------		1,020	1,020	735	1,310	978	233	628
23	182	215	------	------	*150	1,180	998	719	1,280	896	233	564
24	175	207	------	------		1,400	1,140	703	1,340	852	218	498
25	171	218	------	------		1,500	2,400	703	1,210	800	218	461
26	163	211	------	------		2,050	2,040	711	1,180	751	281	425
27	152	211	------	------	*250	2,140	1,780	1,090	1,130	719	321	408
28	146	215	------	------		2,100	1,620	3,560	1,070	719	299	420
29	140	207	------	------		2,110	1,350	4,180	1,040	672	281	403
30	133	200	------	------	------	1,630	1,350	5,140	1,010	635	226	414
31	127	------	------	------	------	1,430	------	5,290	------	635	215	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	237	127	167	10,300
November	398	130	255	15,200
December	------	------	*140	8,610
January	------	------	*110	6,760
February	------	------	*129	7,160
March	3,560	290	1,740	107,000
April	3,840	998	1,800	107,000
May	5,290	703	1,550	95,300
June	16,500	1,010	3,290	196,000
July	1,900	635	1,060	65,200
August	905	215	457	28,100
September	950	193	531	31,600
The year	16,500	------	937	678,000

* Estimated. ♭ Result of discharge measurement.

Digitized by Google

CHEYENNE RIVER NEAR CARLIN, S. DAK.

LOCATION.—Chain gage in sec. 31, T. 9 N., R. 24 E., half a mile above Hermaphrodite Creek and 4 miles northeast of Carlin.
DRAINAGE AREA.—23,400 square miles.
RECORDS AVAILABLE.—August, 1928, to September, 1929.
EXTREMES.—Maximum discharge during year, 49,600 second-feet June 3; maximum gage height, 10.12 feet June 3 and 6; minimum discharge occurred during winter.
1928–29: Maximum and minimum discharge, same as given above.
REMARKS.—Records fair. Observations discontinued Dec. 1 to Mar. 9. Daily discharge not determined Sept. 4–30. Small diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*830	415	-------	9,380	2,950	30,400	1,590	700	481
2	*800	404	-------	9,260	*2,850	39,400	*1,570	700	523
3	*750	415	-------	8,480	*2,700	47,900	*1,550	700	548
4	*700	452	-------	6,820	*2,600	43,400	*1,600	685	-------
5	*650	475	-------	*6,600	2,500	44,600	*1,700	685	-------
6	*620	553	-------	*8,500	2,490	44,200	*1,850	722	-------
7	*570	680	-------	9,850	2,540	30,000	2,020	927	-------
8	*480	779	-------	13,700	2,640	12,000	1,780	1,010	-------
9	415	702	-------	22,000	2,930	5,400	1,690	1,100	-------
10	404	610	2,660	22,200	3,240	4,660	1,710	1,190	-------
11	404	460	2,890	9,820	3,340	4,400	1,620	*1,500	-------
12	393	452	3,190	6,530	2,330	4,070	*1,600	1,760	-------
13	393	499	4,220	6,150	2,390	3,870	*1,600	1,480	♭799
14	393	482	2,930	6,030	2,500	3,440	*1,600	1,140	-------
15	404	490	2,700	5,680	2,490	3,070	*1,600	952	-------
16	415	508	3,020	4,070	2,450	2,930	*1,600	777	-------
17	430	526	3,990	3,360	2,470	2,910	*1,600	768	-------
18	*438	517	4,100	3,120	2,410	2,640	1,620	614	-------
19	445	475	4,100	3,040	2,370	2,640	2,680	586	-------
20	460	430	3,900	3,000	2,300	2,470	2,370	568	-------
21	468	382	3,340	2,930	2,020	2,300	2,110	542	-------
22	438	328	13,600	2,870	1,760	2,180	1,780	529	-------
23	388	328	15,800	2,680	1,590	2,240	1,560	529	-------
24	376	324	13,700	3,900	1,320	2,220	1,380	523	-------
25	393	320	11,700	6,780	1,570	2,170	1,260	511	-------
26	430	324	6,370	5,680	*2,000	2,040	1,150	499	-------
27	445	328	5,430	3,550	2,080	1,910	1,040	548	-------
28	430	*320	5,960	3,310	6,860	1,880	970	499	-------
29	415	*320	6,950	3,210	11,000	1,810	868	511	-------
30	422	*320	8,150	3,160	19,500	1,620	777	548	-------
31	404	-------	8,780	-------	26,500	-------	715	511	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	830	376	484	29,800
November	779	320	454	27,000
March 10–31	15,800	2,660	6,250	273,000
April	22,200	2,680	6,850	408,000
May	26,500	1,320	4,150	255,000
June	47,900	1,620	11,800	702,000
July	2,680	715	1,570	96,500
August	1,760	499	784	48,200
September	-------	-------	*1,080	64,300

* Estimated. ♭ Result of discharge measurement.

Digitized by Google

BEAVER CREEK NEAR BURDOCK, S. DAK.

LOCATION.—Chain gage in sec. 8, T. 7 S., R. 1 E., 2 miles west of Burdock. Zero of gage is 3,547.1 feet above mean sea level.
DRAINAGE AREA.—1,480 square miles.
RECORDS AVAILABLE.—April, 1905, to November, 1906 (published as "Beaver Creek near Edgemont"); April to September, 1929.
EXTREMES.—Maximum discharge during year, 3,280 second-feet May 31 (gage height, 9.05 feet); minimum, 10 second-feet Aug. 25 (gage height, 1.24 foot). 1905–6, 1929: Maximum discharge, 3,530 second-feet Mar. 26, 1906; no flow Aug. 13, 1906.
REMARKS.—Records good below 700 second-feet and fair above. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	-------	62	337	56	26	31	16	-------	45	56	544	25	23
2	-------	59	1,300	69	24	25	17	-------	41	54	186	23	22
3	-------	59	2,590	79	29	21	18	-------	38	52	156	21	22
4	-------	59	592	94	16	22	19	120	41	48	102	18	23
5	-------	59	296	56	17	22	20	127	37	46	87	15	22
6	-------	59	348	43	18	31	21	125	34	40	63	16	22
7	-------	58	234	142	47	31	22	104	22	40	93	30	23
8	-------	62	160	135	276	29	23	100	18	50	79	23	24
9	-------	60	124	75	124	28	24	197	14	50	102	14	21
10	-------	60	108	58	117	26	25	158	12	42	80	10	34
11	-------	59	94	50	51	26	26	110	436	41	80	12	108
12	-------	58	282	36	33	25	27	102	1,380	36	61	15	122
13	-------	55	94	42	43	24	28	85	921	40	47	41	276
14	-------	50	80	302	35	24	29	78	733	36	35	38	122
15	-------	48	66	880	27	24	30	66	1,880	35	32	38	119
							31	-------	2,900	-------	27	89	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 19–30	197	66	115	2,740
May	2,900	12	304	18,700
June	2,590	35	246	14,600
July	880	27	126	7,750
August	276	10	42.4	2,610
September	276	21	45.7	2,720
The period				49,100

RAPID CREEK NEAR PACTOLA, S. DAK.

LOCATION.—Staff gage in sec. 2, T. 1 N., R. 5 E., at Dakota Power & Light Co.'s flume crossing, half a mile below Pactola.
DRAINAGE AREA.—319 square miles.
RECORDS AVAILABLE.—April to September, 1929.
EXTREMES.—Maximum combined discharge of creek and flume during period, 794 second-feet June 3; minimum, 51 second-feet Sept. 22.
REMARKS.—Records good except those for estimated periods, which are fair. Flow of creek regulated by power flume which diverts three-quarters of a mile above station.

Digitized by Google

Daily and monthly discharge, in second-feet, of Rapid Creek near Pactola, S. Dak., 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	-------	231	370	• 116	23	5	16	-------	184	280	• 110	3	2
2	-------	202	537	109	21	3	17	-------	174	260	• 113	3	1
3	-------	193	717	102	18	5	18	-------	164	240	• 85	3	2
4	-------	193	625	98	15	10	19	-------	164	222	• 86	3	2
5	-------	193	603	132	13	7	20	-------	155	193	• 72	3	1
6	-------	174	537	• 126	24	7	21	83	146	193	• 65	3	1
7	-------	174	537	• 105	33	10	22	136	146	202	• 66	3	1
8	-------	155	494	• 119	38	13	23	212	136	193	• 55	2	3
9	-------	155	452	• 100	26	10	24	231	• 135	280	• 50	1	3
10	-------	193	410	• 87	24	6	25	174	• 150	212	• 40	3	20
11	-------	174	410	• 69	18	4	26	193	280	164	27	4	52
12	-------	174	431	• 58	14	3	27	202	350	146	• 25	11	46
13	-------	174	370	• 61	10	3	28	193	300	146	23	21	25
14	-------	193	330	• 200	8	1	29	• 220	370	• 135	23	14	16
15	-------	193	300	• 135	6	2	30	231	390	• 125	24	10	14
							31	-------	370	-------	20	10	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 21–30	231	83	168	3,780
May	390	125	206	12,700
June	717	125	337	20,100
July	200	20	80.6	4,960
August	83	1	14.1	867
September	52	1	9.3	553
The period				42,900

• Estimated.

Combined daily and monthly discharge, in second-feet, of Rapid Creek and Dakota Power & Light Co.'s flume near Pactola, S. Dak., 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	-------	310	447	186	101	76	16	-------	263	354	190	81	61
2	-------	278	629	186	100	69	17	-------	250	342	193	79	59
3	-------	269	789	179	95	75	18	-------	240	303	165	78	59
4	-------	269	688	176	93	86	19	-------	240	292	166	75	60
5	-------	263	679	213	92	82	20	-------	231	269	152	73	57
6	-------	239	613	205	111	84	21	164	222	272	145	69	55
7	-------	247	615	185	162	89	22	144	223	280	146	65	52
8	-------	224	570	199	119	92	23	212	212	274	135	60	61
9	-------	227	530	180	105	87	24	238	211	280	130	57	63
10	-------	269	486	167	105	82	25	204	225	220	120	59	96
11	-------	251	490	149	95	78	26	236	354	215	106	75	132
12	-------	250	507	138	93	72	27	269	421	213	103	89	122
13	-------	253	446	141	87	70	28	275	377	209	101	98	104
14	-------	270	406	280	87	64	29	301	449	214	99	90	93
15	-------	272	374	215	84	63	30	312	470	208	101	90	90
							31	-------	448	-------	97	85	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 21–30	312	144	236	4,680
May	470	211	282	17,300
June	789	203	407	24,200
July	280	97	159	9,780
August	162	57	88.7	5,450
September	132	52	77.8	4,630
The period				66,000

Digitized by Google

RAPID CREEK AT CRESTON, S. DAK.

LOCATION.—Staff gage in sec. 33, T. 1 S., R. 12 E., half a mile west of Creston.
DRAINAGE AREA.—710 square miles.
RECORDS AVAILABLE.—April to September, 1929.
EXTREMES.—Maximum discharge during period, 2,740 second-feet June 2 (gage height, 8.6 feet); minimum, 26 second-feet Aug. 24 (gage height, 1.86 feet).
REMARKS.—Records fair. Diversions for irrigation above station.

Daily discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	518	538	230	73	50	16	------	335	510	305	58	79
2	------	552	1,690	246	70	54	17	------	341	472	233	44	81
3	------	518	1,920	217	81	62	18	------	335	398	214	50	79
4	------	430	1,330	244	73	42	19	------	249	356	196	50	79
5	------	335	1,240	233	71	48	20	------	246	338	193	45	79
6	------	350	1,090	244	73	51	21	------	260	314	183	44	79
7	------	412	996	225	70	55	22	217	249	305	178	41	86
8	------	412	744	217	74	63	23	423	266	329	302	35	86
9	------	365	700	230	66	60	24	712	249	344	167	27	89
10	------	350	780	225	108	55	25	672	246	347	160	29	95
11	------	350	776	225	100	51	26	448	271	305	144	28	97
12	------	350	744	183	102	54	27	350	311	288	147	31	98
13	------	320	720	157	88	62	28	263	347	271	121	35	93
14	------	320	626	201	78	70	29	680	420	249	119	35	95
15	------	320	570	260	66	76	30	622	535	236	113	66	91
							31	------	538	------	76	58	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 22-30	712	217	487	8,690
May	552	246	358	22,000
June	1,920	236	651	38,700
July	305	76	200	12,300
August	108	27	60.3	3,710
September	98	42	72.0	4,280
The period	------	------	------	89,700

Digitized by Google

BELLE FOURCHE RIVER NEAR MOORCROFT, WYO.

LOCATION.—Chain gage in sec. 36, T. 50 N., R. 68 W., 1½ miles west of Moorcroft. Zero of gage is 4,133.44 feet above mean sea level.
DRAINAGE AREA.—1,380 square miles.
RECORDS AVAILABLE.—September, 1923, to September, 1929.
EXTREMES.—Maximum discharge during year, 9,060 second-feet Apr. 5 (gage height, 12.36 feet); no flow Oct. 1–13, 15, 28, and 29.
1923–1929: Maximum discharge, 12,500 second-feet Apr. 7, 1924 (gage height, 12.6 feet); no flow several days in September and October, 1928.
REMARKS.—Records good except those for estimated periods, Mar. 1–9 and 14–28, which are fair. Observations discontinued Nov. 4 to Feb. 28. Small diversion by pumping for railroad just above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	2		1,310	139	2,470	14	6	5
2	0	1		974	148	1,020	14	6	4
3	0	1		1,630	142	1,290	13	6	3
4	0	------		3,780	106	1,140	13	6	3
5	0	------	100	8,750	89	533	232	5	
6	0	------		6,040	59	425	193	5	3
7	0	------		2,140	62	372	89	5	3
8	0	------		1,020	103	307	40	5	3
9	0	------	131	719	72	243	25	5	3
10	0	------	1,080	554	51	207	18	11	3
11	0	------	2,200	436	27	181	16	8	3
12	0	------	2,880	387	16	251	13	6	3
13	0	------	2,500	393	12	163	12	5	3
14	.2	------	1,000	384	11	120	638	5	3
15	0	------	100	375	9	106	145	5	3
16	.4	------	75	364	8	89	45	4	3
17	.2	------	50	372	7	67	32	4	3
18	.2	------	25	358	6	62	18	4	3
19	.2	------	30	302	6	59	12	3	3
20	.2	------	60	257	5	51	11	3	3
21	.4	------	150	215	5	45	9	3	2
22	.2	------	300	207	5	40	8	3	2
23	.2	------	180	204	4	40	8	3	3
24	.2	------	70	327	4	43	8	3	3
25	.2	------	30	285	6	72	8	3	38
26	.2	------	20	215	296	48	7	3	324
27	.2	------	50	181	842	35	7	3	243
28	0	------	250	165	198	22	7	3	59
29	0	------	2,280	156	1,270	19	6	3	12
30	.8	------	2,330	179	1,680	17	6	3	8
31	1.0	------	1,680	------	497	------	6	7	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1	0	0.15	9.2
March	2,880	20	589	36,200
April	8,750	156	1,090	64,900
May	1,680	4	190	11,700
June	2,470	17	318	18,900
July	638	6	54.0	3,320
August	11	3	4.65	286
September	324	2	25.2	1,500

Digitized by Google

BELLE FOURCHE RIVER AT HULETT, WYO.

LOCATION.—Chain gage in sec. 12, T. 54 N., R. 65 W., at south edge of Hulett. Zero of gage is 3,742.05 feet above mean sea level.
DRAINAGE AREA.—2,800 square miles.
RECORDS AVAILABLE.—April to September, 1929.
EXTREMES.—Maximum discharge during year, about 6,230 second-feet May 31 (gage height, 8.9 feet); minimum, 22 second-feet Sept. 1 and 2 (gage height, 1.63 feet).
REMARKS.—Records good. No diversions above station.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	527	4,230	138	56	22	16	------	305	270	437	40	24
2	------	486	3,650	143	54	22	17	------	284	250	198	42	23
3	------	473	2,220	143	52	23	18	------	274	228	179	39	23
4	------	478	2,040	138	52	25	19	------	260	218	146	38	23
5	------	455	1,680	132	59	25	20	------	232	194	143	36	23
6	------	414	850	143	117	23	21	------	232	191	135	34	23
7	------	410	710	305	124	29	22	------	228	191	127	34	23
8	------	419	615	242	107	28	23	------	211	169	65	32	24
9	------	419	514	179	80	28	24	------	205	185	63	30	23
10	------	406	432	143	61	28	25	------	198	166	59	30	25
11	------	342	370	124	50	26	26	------	563	172	59	30	42
12	------	334	362	112	49	26	27	------	690	188	59	29	1,150
13	------	323	350	112	45	25	28	------	274	176	65	28	1,020
14	------	319	319	160	42	25	29	554	2,480	160	59	26	313
15	------	323	278	326	40	25	30	545	5,390	154	59	25	176
							31	------	6,180	-------	58	25	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 29-30	554	545	550	2,180
May	6,180	198	779	47,900
June	4,230	154	718	42,700
July	437	58	144	8,850
August	124	25	48.6	2,990
September	1,150	22	110	6,550
The period	----------	----------	----------	111,000

Digitized by Google

BELLE FOURCHE RIVER NEAR BELLE FOURCHE, S. DAK.

LOCATION.—Staff gage in sec. 2, T. 8 N., R. 2 E., at diversion dam of Belle Fourche irrigation project 1½ miles below Belle Fourche.

DRAINAGE AREA.—4,310 square miles.

RECORDS AVAILABLE.—May to November, 1906; January, 1912, to September, 1929.

EXTREMES.—Maximum discharge during year, 15,000 second-feet Apr. 8; minimum, 61 second-feet Jan. 25.

1912–1929: Maximum discharge, 22,400 second-feet Apr. 9, 1924; no flow for several days during 1914 and 1919.

REMARKS.—Records include flow diverted at Belle Fourche diversion dam. Other diversions for irrigation above station. Flow regulated by Belle Fourche Reservoir. Complete records furnished by the United States Bureau of Reclamation.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	226	186	178	167	127	140	4,640	1,400	7,130	432	102	70
2	179	186	175	191	132	141	4,640	1,370	5,260	432	101	70
3	198	178	174	186	137	141	3,300	1,340	3,550	428	98	70
4	193	178	160	133	140	141	3,380	1,250	2,050	424	81	71
5	193	187	198	134	151	349	4,880	1,150	2,760	428	96	71
6	193	482	154	138	115	3,160	2,870	1,150	2,760	424	78	71
7	192	274	154	201	119	856	13,900	1,150	1,840	439	79	71
8	192	260	180	196	128	862	15,000	1,300	1,250	439	104	71
9	194	267	172	196	131	482	5,240	1,300	1,250	438	104	71
10	194	260	162	170	135	358	3,760	1,360	1,010	442	104	71
11	194	260	160	160	141	759	2,680	1,030	963	438	106	71
12	186	267	161	171	141	906	2,450	1,030	967	438	97	71
13	199	240	160	165	145	1,040	1,760	1,030	828	436	104	71
14	199	184	158	163	146	3,580	1,880	1,030	704	438	104	71
15	199	201	160	145	149	4,580	1,760	960	828	435	103	71
16	199	217	157	150	145	3,080	1,880	950	599	405	103	71
17	199	200	149	134	143	1,230	1,980	950	587	425	103	133
18	199	185	152	140	141	750	1,920	1,070	616	425	102	133
19	199	161	189	118	135	737	1,920	822	616	418	102	133
20	213	158	192	117	144	2,170	2,010	827	616	418	99	162
21	216	192	227	113	144	5,450	1,730	777	553	412	68	179
22	216	197	215	174	142	2,460	1,660	777	553	379	70	190
23	216	197	173	126	144	2,040	1,660	715	553	311	70	190
24	216	197	179	122	145	1,850	2,630	715	522	236	70	189
25	216	173	176	61	141	1,640	2,260	715	439	221	70	241
26	213	176	174	118	141	1,490	1,940	1,560	439	170	70	468
27	212	180	186	125	141	1,370	1,850	2,710	439	180	70	367
28	199	180	186	113	140	1,930	1,730	1,880	439	145	70	279
29	203	180	171	121	-------	2,470	1,670	4,160	439	101	70	575
30	205	180	229	118	-------	3,430	1,670	3,340	439	102	70	511
31	102	-------	162	118	-------	4,500	-------	6,340	-------	102	70	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	226	102	199	12,200
November	482	158	213	12,700
December	229	149	175	10,800
January	201	61	145	8,920
February	151	115	139	7,720
March	5,450	140	1,740	107,000
April	15,000	1,660	3,360	200,000
May	6,340	715	1,490	91,600
June	7,130	439	1,370	81,500
July	442	101	354	21,800
August	106	68	88.0	5,410
September	575	70	163	9,700
The year	15,000	61	786	569,000

Digitized by Google

BELLE FOURCHE RIVER NEAR ELM SPRINGS, S. DAK.

LOCATION.—Chain gage in sec. 26, T. 5 N., R. 13 E., 6 miles northeast of Elm Springs.

DRAINAGE AREA.—7,130 square miles.

RECORDS AVAILABLE.—August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 33,500 second-feet June 3 (gage height, 11.3 feet); minimum, 42 second-feet Nov. 26.

REMARKS.—Records good below 8,000 second-feet except those for estimated periods; others fair. Observations discontinued Dec. 1 to Mar. 9. Diversions for irrigation above station. Flow partly regulated by Belle Fourche Reservoir.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*414	279	-------	4,860	1,170	14,200	350	220	376
2	*416	335	-------	5,690	1,210	22,600	343	237	376
3	*418	279	-------	4,320	1,130	28,500	324	282	402
4	*420	342	-------	3,790	1,050	11,300	306	259	434
5	*422	335	-------	3,230	999	8,980	324	259	495
6	*424	473	-------	6,520	954	7,090	369	306	530
7	*425	361	-------	9,480	918	5,520	685	356	552
8	426	213	-------	16,700	1,060	3,380	762	582	590
9	374	196	-------	23,100	1,020	2,460	753	645	598
10	354	285	2,330	7,720	1,250	2,210	582	530	613
11	374	285	1,570	3,980	981	*1,800	530	545	552
12	291	285	1,590	2,810	1,270	1,270	575	509	523
13	298	273	1,070	2,580	1,260	1,160	454	434	516
14	316	261	*1,100	2,000	1,230	1,080	395	376	*520
15	316	304	1,490	1,660	1,210	954	467	300	523
16	304	174	3,350	1,660	1,230	844	516	276	454
17	310	114	2,190	1,380	1,250	804	481	270	440
18	298	92	1,080	1,520	1,200	719	395	264	434
19	310	66	999	1,440	1,170	621	376	276	440
20	285	55	900	1,470	669	568	552	300	428
21	267	64	10,700	1,440	575	495	598	324	428
22	273	69	14,900	1,300	530	460	488	318	395
23	298	71	7,130	1,230	421	590	421	300	375
24	285	84	4,150	1,310	356	414	362	300	356
25	285	87	2,410	2,690	382	395	300	336	388
26	279	48	2,250	1,960	408	382	242	318	560
27	279	*50	3,280	1,570	4,800	434	220	343	1,740
28	261	*50	4,740	1,280	6,440	447	205	369	1,200
29	267	*50	4,440	1,350	17,800	421	200	300	873
30	273	*50	4,350	1,160	17,200	382	195	324	509
31	279	-------	4,180	-------	9,610	-------	220	343	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	426	261	330	20,300
November	473	48	188	11,200
March 10–31	14,900	900	3,650	159,000
April	23,100	1,160	4,040	240,000
May	17,800	356	2,600	160,000
June	28,500	382	4,020	239,000
July	762	195	419	25,800
August	645	220	348	21,400
September	1,740	356	554	33,000

* Estimated.

Digitized by Google

REDWATER CREEK NEAR BEULAH, WYO.

LOCATION.—Staff gage in sec. 29, T. 7 N., R. 60 W., 1¼ miles downstream from Beulah.
DRAINAGE AREA.—459 square miles.
RECORDS AVAILABLE.—April to September, 1929.
EXTREMES.—Maximum discharge during period, 515 second-feet May 26 and 27 (gage height, 6.20 feet); no flow Aug. 13–15.
REMARKS.—Records good. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	163	242	89	67	62	16	------	184	109	89	65	62
2	------	156	300	98	67	62	17	------	163	92	82	65	62
3	------	133	280	92	61	62	18	------	167	92	78	70	62
4	------	150	219	92	68	62	19	------	146	90	75	63	62
5	------	140	205	92	68	62	20	------	140	92	75	60	62
6	------	120	201	92	82	62	21	------	127	92	75	60	62
7	------	120	173	92	75	62	22	------	127	92	75	60	62
8	------	120	173	92	75	62	23	------	120	92	75	60	62
9	------	136	146	92	72	62	24	------	114	95	75	60	62
10	------	150	130	90	72	62	25	146	114	92	75	60	74
11	------	130	123	92	67	62	26	153	389	95	71	60	72
12	------	146	133	92	67	62	27	136	425	92	67	60	72
13	------	153	120	92	0	62	28	120	242	92	67	60	72
14	------	160	114	92	0	62	29	153	280	92	65	59	72
15	------	205	109	89	0	62	30	173	340	92	65	58	72
							31	------	261	------	67	60	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 25–30	173	120	147	1,750
May	425	114	178	10,900
June	300	90	136	8,090
July	98	65	82.4	5,070
August	82	0	58.7	3,610
September	74	62	64.1	3,810
The period	------	------	------	33,200

Digitized by Google

BAD RIVER BASIN

BAD RIVER NEAR FORT PIERRE, S. DAK.

LOCATION.—Chain gage in sec. 10, T. 4 N., R. 31 E., 2½ miles south of Fort Pierre.
DRAINAGE AREA.—3,170 square miles. Zero of gage is 1,427.83 feet above mean sea level.
RECORDS AVAILABLE.—August, 1928, to September, 1929.
EXTREMES.—Maximum discharge during year, 11,100 second-feet Apr. 25 (gage height, 21.18 feet); no flow during several months.
Maximum stage known, 30.89 feet in 1905, and in April, 1927.
REMARKS.—Records good. No diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Mar.	Apr.	May	June	July	Day	Mar.	Apr.	May	June	July
1	* 50	587	175	206	0	16	243	1,740	47	154	4.1
2	* 100	253	133	58	0	17	161	900	39	79	2.7
3	* 200	161	108	307	0	18	126	380	32	45	1.0
4	263	106	88	140	0	19	89	198	23	24	0
5	1,540	71	75	54	0	20	60	133	15	19	0
6	2,750	50	64	621	0	21	49	87	13	12	0
7	1,300	67	55	243	0	22	434	60	11	7.6	0
8	1,110	58	53	175	0	23	621	40	6.9	3.4	0
9	830	39	50	95	0	24	587	2,450	4.1	1.0	0
10	1,040	22	46	62	168	25	330	6,900	0	0	0
11	1,040	38	40	65	78	26	224	3,500	13	0	0
12	865	109	34	47	47	27	234	2,100	87	0	0
13	760	655	79	45	21	28	126	1,080	43	0	0
14	434	1,180	89	621	18	29	97	434	31	0	0
15	307	1,380	68	463	9.8	30	725	253	15	0	0
						31	1,080		524		0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
February			* 10	555
March	2,750	49	573	35,200
April	6,900	22	834	49,600
May	524	0	66.5	4,090
June	621	0	118	7,020
July	168	0	11.3	695
The year	6,900	0	134	97,200

* Estimated.
NOTE.—No flow during October to January, August, and September. Daily discharge not determined for February.

Digitized by Google

WHITE RIVER BASIN

WHITE RIVER NEAR INTERIOR, S. DAK.

LOCATION.—Staff gage in sec. 7, T. 4 S., R. 18 E., 3 miles southwest of Interior.
DRAINAGE AREA.—4,120 square miles.
RECORDS AVAILABLE.—June, 1904, to November, 1906; August, 1911, to September, 1918; August, 1928, to September, 1929.
EXTREMES.—Maximum discharge during year, 4,600 second-feet Mar. 5 (gage height, 7.5 feet); minimum, 11 second-feet Oct. 10, 11, and Sept. 2.
1904–1906, 1911–1918, 1928–29: Maximum discharge, 16,500 second-feet Mar. 8, 1905 (gage height, 14 feet, present datum); no flow July 13–15, 19–29, and Sept. 26 to Oct. 4, 1914.
REMARKS.—Records fair. Daily discharge not determined Dec. 1 to Feb. 28. No diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	51	[a] 500	575	255	679	60	19	12
2	17	47	[a] 1,000	535	214	2,090	64	214	11
3	17	41	[a] 1,500	515	190	3,080	106	49	14
4	20	85	[a] 2,000	325	190	994	124	22	17
5	19	198	[a] 2,800	248	204	679	621	14	15
6	17	277	2,520	220	262	396	1,110	14	81
7	16	364	1,480	190	355	520	485	450	565
8	13	325	1,240	190	420	510	273	410	289
9	12	168	970	195	440	312	364	255	844
10	11	137	679	400	269	575	165	94	485
11	11	128	490	545	201	880	342	83	204
12	16	130	626	1,510	181	970	187	83	184
13	17	120	214	1,010	168	425	110	59	130
14	22	101	108	674	150	262	1,030	55	148
15	610	100	190	550	143	204	304	42	93
16	207	[a] 90	712	480	137	184	162	30	65
17	89		850	405	132	158	292	25	55
18	57		880	321	128	132	89	18	46
19	65		1,130	227	122	118	68	14	39
20	59	60	934	178	118	105	56	14	34
21	56	86	856	160	116	93	54	46	28
22	56	86	1,050	148	118	89	46	55	27
23	59	86	1,300	137	118	124	47	22	37
24	54	85	820	1,160	110	560	55	14	34
25	53	42	791	2,260	105	308	61	18	86
26	47	60	1,050	803	106	130	78	25	595
27	45	62	1,240	585	234	108	45	105	415
28	44	47	976	545	187	85	45	49	137
29	45	26	652	475	525	75	30	22	80
30	49	34	475	351	244	69	25	15	64
31	53	-------	470	-------	308	-------	17	12	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	610	11	60.3	3,710
November	364	26	110	6,550
December	-------	-------	[a] 30	1,840
January	-------	-------	[a] 25	1,540
February	-------	-------	[a] 25	1,390
March	2,800	108	984	60,500
April	2,260	137	531	31,600
May	525	105	208	12,800
June	3,080	69	497	29,600
July	1,110	17	210	12,900
August	450	12	75.7	4,650
September	844	11	161	9,580
The year	2,800	11	244	177,000

[a] Estimated.

Digitized by Google

WHITE RIVER NEAR OACOMA, S. DAK.

LOCATION.—Chain gage in sec. 21, T. 103 N., R. 72 W., 6 miles southwest of Oacoma.
DRAINAGE AREA.—10,100 square miles.
RECORDS AVAILABLE.—August, 1928, to September ,1929.
EXTREMES.—Maximum discharge during year, 9,720 second-feet Mar. 10 (gage height, 6.6 feet); minimum occurred during winter.
REMARKS.—Records fair. No diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	116	212	*97				1,530	1,320	850	352	80	70
2	101	200	*80				1,380	1,130	490	323	80	66
3	97	188	*70		*65	*150	955	1,130	850	287	80	55
4	97	172	61				2,270	1,010	955	278	68	63
5	80	245	*70				800	600	4,690	270	47	74
6	84	274	*100	*80			800	700	2,800	261	122	70
7	76	257	122			1,000	800	650	2,370	253	188	74
8	76	347	128		*51		955	220	1,880	236	164	78
9	72	274	156			7,020	650	220	1,320	228	148	82
10	72	403	212			9,120	520	378	900	1,460	128	99
11	72	650	245			4,420	520	700	900	1,250	108	88
12	68	*600	278			2,070	520	700	900	650	82	88
13	80	*500	261	*48	*61	1,790	520	1,880	700	490	378	800
14	80	*450	236			1,620	600	1,010	800	700	338	900
15	116	*600	253			1,880	3,390	650	560	520	265	600
16	164	*500	245			1,620	2,070	378	1,130	304	224	459
17	140	*350	245			1,250	2,070	378	1,130	352	176	342
18	1,320	282	212	*40	*64	850	1,380	520	600	295	137	287
19	1,190	282	*200			490	955	490	459	800	119	270
20	800	*290	*180			431	900	459	378	800	108	212
21	490	291	172			3,150	700	459	378	287	52	196
22	403	378	172			2,370	600	431	287	1,010	99	172
23	338	333	156	*39		2,170	600	431	295	700	192	148
24	295	287	148			2,170	700	378	261	333	224	122
25	261	270	188		*78	2,680	750	304	236	204	131	128
26	228	236	188			2,170	7,620	342	236	140	119	116
27	220	236	*180			1,980	4,690	342	212	140	113	106
28	204	245	*170	*48		1,620	3,640	431	196	116	101	101
29	204	270	*160		------	1,620	2,470	403	228	116	95	101
30	196	*250	*150		------	2,470	1,530	342	850	110	90	88
31	204	------	*150		------	2,370	------	342	------	106	78	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,320	68	256	15,700
November	650	172	329	19,600
December	278	61	170	10,500
January	----------	----------	54	3,320
February	----------	----------	65	3,610
March	9,120	----------	1,970	121,000
April	7,620	520	1,560	92,800
May	1,880	220	604	37,100
June	4,690	196	928	55,200
July	1,460	106	431	26,500
August	378	47	140	8,610
September	900	55	202	12,000
The year	9,120	----------	561	406,000

* Estimated.

Digitized by Google

LOCATION.—Chain gage in sec. 14, T. 41 N., R. 28 E., 4½ miles south of White River.
DRAINAGE AREA.—1,390 square miles.
RECORDS AVAILABLE.—April to September, 1929.
EXTREMES.—Maximum discharge during period, 450 second-feet Apr. 24; minimum, 40 second-feet Aug. 25 (gage height, 2.30 feet).
REMARKS.—Records good. Discharge estimated Sept. 10 and 11.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	380	180	84	62	42	16	267	230	144	82	44	86
2	------	355	262	82	66	50	17	278	221	134	100	44	79
3	------	267	208	72	62	51	18	286	211	126	82	44	75
4	------	235	182	86	57	52	19	289	188	112	79	63	75
5	------	230	180	88	57	57	20	267	182	109	77	48	81
6	------	249	174	91	55	72	21	238	174	104	75	47	79
7	------	235	195	91	57	79	22	245	185	107	81	45	79
8	------	235	198	79	52	86	23	221	185	107	77	42	84
9	259	221	185	81	52	98	24	331	180	109	73	41	86
10	278	288	182	75	52	90	25	405	171	98	73	40	98
11	274	288	185	79	50	82	26	365	166	100	70	95	98
12	267	262	177	75	51	73	27	355	157	95	70	73	86
13	267	262	157	72	48	82	28	314	168	91	68	62	95
14	274	253	152	81	46	98	29	340	174	84	65	51	86
15	274	230	157	91	45	91	30	360	163	86	63	52	82
							31	------	168	------	62	47	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 9–30	405	221	293	12,800
May	380	157	223	13,700
June	262	84	146	8,690
July	100	62	78.2	4,810
August	95	40	53.2	3,270
September	98	42	79.1	4,710
The period				48,000

Digitized by Google

NIOBRARA RIVER BASIN

NIOBRARA RIVER NEAR GORDON, NEBR.

LOCATION.—Staff gage in sec. 15, T. 31 N., R. 41 W., 14 miles southeast of Gordon.

DRAINAGE AREA.—3,050 square miles.

RECORDS AVAILABLE.—August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, about 1,230 second-feet June 2 (gage height, 1.80 feet); minimum, 61 second-feet July 25.

1928–29: Maximum and minimum discharge, same as given above.

REMARKS.—Records fair. Observations discontinued Dec. 6 to Feb. 28. No diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	109	168	192	*120	256	146	1,080	131	66	74
2	108	151	*174	*140	238	143	1,190	143	68	78
3	112	178	156	*160	256	150	1,070	139	66	80
4	118	206	*137	*180	280	156	215	131	70	103
5	113	199	*118	*200	256	170	*160	156	70	131
6	116	230	.....	*300	247	167	*120	713	69	163
7	113	216	.....	*400	233	156	105	324	111	219
8	114	178	.....	*500	224	143	100	178	109	190
9	113	185	.....	*500	247	146	80	146	*108	186
10	113	185	.....	462	286	182	64	124	107	167
11	111	174	.....	436	274	170	76	114	103	153
12	113	182	.....	*300	286	163	78	134	109	131
13	120	182	.....	*200	286	163	80	160	103	124
14	136	185	.....	139	354	170	100	774	90	121
15	410	192	.....	170	262	182	121	310	94	118
16	268	182	.....	206	256	143	124	602	96	118
17	216	*182	.....	304	251	150	114	186	*90	124
18	188	182	.....	280	251	156	114	134	82	116
19	168	178	.....	346	251	190	114	118	84	118
20	164	182	.....	304	256	186	111	100	84	134
21	156	192	.....	292	251	190	105	94	*83	134
22	168	185	.....	280	274	210	105	92	*83	139
23	185	178	.....	280	242	233	242	86	82	136
24	196	185	.....	256	453	202	215	70	80	124
25	185	185	.....	268	324	178	206	64	84	121
26	164	182	.....	*260	316	304	198	63	74	160
27	156	185	.....	251	292	215	167	69	72	167
28	161	178	.....	247	280	268	134	69	84	153
29	166	182	.....	228	219	219	126	72	76	153
30	174	188	.....	219	163	219	139	76	78	156
31	178	.....	.....	233	.....	572	.....	72	82	.....

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	410	108	158	9,710
November	230	151	185	11,000
March	500	120	273	16,800
April	453	163	268	15,900
May	572	143	195	12,000
June	1,190	64	228	13,600
July	713	63	182	11,200
August	111	66	85.7	5,270
September	219	74	136	8,090

* Estimated.

Digitized by Google

NIOBRARA RIVER NEAR VALENTINE, NEBR.

LOCATION.—Chain gage in sec. 30, T. 33 N., R. 28 W., 7 miles southwest of Valentine.

DRAINAGE AREA.—6,160 square miles.

RECORDS AVAILABLE.—June, 1897, to December, 1906; August, 1928, to September, 1929.

REMARKS.—Records fair. Discharge estimated except on days when current-meter measurements were made. No diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	785	915				1,110	1,110	840	1,620	730	650	760
2		a 914	a 924									a 780
3		920										
4												
5	a 786		a 692						a 1,190			
6	790	980				1,480	1,070	850	830	1,020	670	890
7											a 686	
8												
9												
10												
11	820	980				1,200	1,120	870	630	1,140	740	870
12												
13												
14												
15												
16	980	a 987	a 719			1,170	1,070	840	670	1,120	700	720
17		985						a 858				
18												
19												
20					a 697							
21	850	960				1,200	a 1,030	890	a 670	a 738	720	a 713
22							1,150		720	740		720
23												
24												
25												
26	860	940				1,170	1,030	1,090	700	710	700	780
27						1,170						
28						a 1,170						
29												
30						1,170						
31												

Month	Mean	Run-off in acre-feet	Month	Mean	Run-off in acre-feet
October	846	52,000	May	903	55,500
November	960	57,100	June	844	50,200
December	700	43,000	July	916	56,300
January	650	40,000	August	700	43,000
February	675	37,500	September	794	47,200
March	1,220	75,000			
April	1,090	64,900	The year	859	622,000

a Result of discharge measurement.

Digitized by Google

NIOBRARA RIVER NEAR SPENCER, NEBR.

LOCATION.—At power plant of Northern Nebraska Power Co. in N. ½ sec. 30, T. 33 N., R. 11 W., 5 miles southeast of Spencer.

DRAINAGE AREA.—10,800 square miles.

RECORDS AVAILABLE.—May to December, 1908; August, 1927, to September, 1929.

EXTREMES.—Maximum discharge during year, 6,720 second-feet June 6; minimum, 20 second-feet leakage through gates.

1927–1929: Maximum discharge occurred during 1929.

REMARKS.—Records good except those for winter period, which are fair. Flow regulated by Spencer Reservoir; capacity, 2,300 acre-feet. Discharge computed from flow over dam and through gates and turbines. Base data furnished by Northern Nebraska Power Co.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,190	1,400	1,190	641	694	973	1,680	1,490	1,090	944	851	718
2	1,130	1,060	1,250	638	756	1,100	1,270	1,520	2,320	905	946	713
3	1,130	1,110	969	435	611	1,030	1,290	1,410	3,110	1,010	850	755
4	1,080	1,280	699	1,060	820	1,160	1,250	1,530	3,420	790	679	1,680
5	1,110	1,720	502	767	764	1,310	1,270	829	3,000	925	1,210	1,450
6	1,150	1,950	883	390	758	1,540	1,280	1,620	5,470	1,280	760	964
7	1,120	1,480	947	484	849	1,550	1,290	1,580	4,850	899	792	1,350
8	1,360	1,220	1,010	343	903	1,920	1,190	1,610	3,160	1,620	786	1,200
9	1,200	1,510	900	350	967	1,960	1,070	1,540	1,990	1,470	872	1,900
10	1,110	1,520	1,030	266	802	2,780	1,320	1,570	2,200	1,150	860	1,550
11	1,020	1,400	1,130	391	817	3,790	1,590	1,630	1,470	1,030	690	1,170
12	1,040	1,290	1,470	1,040	849	5,250	1,460	900	1,360	976	1,120	1,390
13	1,130	1,580	1,470	879	949	5,240	1,290	1,540	1,460	876	850	980
14	1,220	1,500	1,690	1,050	868	4,290	1,280	1,480	1,300	1,080	783	1,210
15	1,340	1,290	1,700	980	903	3,160	1,500	1,360	1,150	1,560	827	818
16	1,430	1,360	1,450	950	977	2,350	1,500	1,390	740	966	654	1,280
17	2,110	1,490	1,360	872	816	2,430	997	1,150	1,130	1,190	756	925
18	1,760	1,380	883	881	983	2,630	1,010	1,270	1,080	2,600	506	970
19	1,240	1,690	773	1,020	968	2,370	1,020	892	916	1,550	864	971
20	1,280	1,110	415	791	948	2,020	1,080	1,660	1,090	936	846	986
21	1,090	1,400	825	855	877	1,770	936	1,160	890	796	832	1,000
22	1,350	1,060	793	661	902	1,600	993	1,090	928	1,100	664	762
23	1,160	1,200	801	749	993	1,660	954	1,130	688	1,040	961	1,180
24	1,030	1,310	1,340	500	858	1,440	1,710	900	1,180	997	938	901
25	1,010	1,060	1,160	423	959	1,550	1,850	1,280	937	970	668	905
26	1,240	1,170	1,650	473	983	1,470	1,900	644	1,130	879	752	2,640
27	1,190	1,250	1,540	317	1,050	1,470	1,880	1,510	1,490	963	700	1,590
28	1,160	1,390	2,020	340	1,010	1,420	1,690	1,080	899	742	744	1,080
29	1,220	1,250	1,780	377	-------	1,190	1,560	1,920	980	874	779	1,140
30	1,390	1,140	1,460	538	-------	1,180	1,540	1,580	687	761	938	1,430
31	1,520	-------	1,500	523	-------	1,540	-------	1,550	-------	522	831	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2,110	1,010	1,240	76,200
November	1,950	1,060	1,350	80,300
December	2,020	415	1,180	72,600
January	1,060	266	645	39,700
February	1,050	611	880	48,900
March	5,250	973	2,100	129,000
April	1,900	936	1,350	80,300
May	1,920	644	1,350	83,000
June	5,470	687	1,740	104,000
July	2,600	522	1,080	66,400
August	1,210	506	817	50,200
September	2,640	713	1,190	70,800
The year	5,470	266	1,240	901,000

Digitized by Google

JAMES RIVER BASIN

JAMES RIVER AT JAMESTOWN, N. DAK.

LOCATION.—Staff gage in SE. ¼ sec. 36, T. 140 N., R. 64 W., 1 mile southeast of the Northern Pacific Railway depot at Jamestown.
DRAINAGE AREA.—3,140 square miles.
RECORDS AVAILABLE.—June, 1928, to September, 1929.
EXTREMES.—Maximum discharge during year, 1,100 second-feet Mar. 14 (gage height, 14.2 feet); minimum, 0.2 second-foot September 6, 7, and 15–18.
1928–29: Maximum and minimum discharge, same as given above.
REMARKS.—Records fair. No diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	2.0	4.0	2.0	2.0	2.0	43	43	19	8.4	0.6	1.0
2	15	2.0	4.0	2.0	2.0	2.0	52	43	19	8.4	.6	.6
3	15	2.0	4.0	2.0	2.0	2.0	43	43	14	8.4	.6	.6
4	15	2.0	4.0	2.0	2.0	2.0	43	35	14	8.4	.6	.6
5	15	4.0	2.0	2.0	2.0	2.0	43	34	14	8.4	.6	.8
6	15	4.0	2.0	2.0	2.0	2.0	43	34	14	8.4	.6	.2
7	15	4.0	2.0	2.0	2.0	2.0	53	34	14	5.2	.6	.2
8	15	4.0	2.0	2.0	2.0	2.0	43	33	14	5.2	.6	.4
9	15	4.0	2.0	2.0	2.0	2.0	43	26	14	5.2	.6	.4
10	15	4.0	2.0	2.0	2.0	10.2	43	33	14	5.2	.6	.4
11	15	4.0	2.0	2.0	2.0	102	44	33	14	5.2	.6	.4
12	10.2	4.0	2.0	2.0	2.0	276	44	33	14	5.2	.6	.6
13	10.2	4.0	2.0	2.0	2.0	626	44	33	14	5.2	.6	.6
14	10.2	6.5	4.0	2.0	2.0	989	44	33	14	3.0	.6	.6
15	10.2	6.5	4.0	2.0	2.0	887	44	26	14	3.0	.6	.2
16	10.2	10.2	4.0	2.0	2.0	535	44	26	13	2.8	.6	.2
17	10.2	10.2	4.0	2.0	2.0	430	44	26	13	2.8	.6	.2
18	10.2	10.2	2.0	2.0	2.0	416	44	26	8.7	2.8	.6	.2
19	10.2	10.2	2.0	2.0	2.0	276	44	26	8.7	2.8	.6	.4
20	10.2	6.5	2.0	2.0	2.0	184	44	20	8.7	2.8	.6	.4
21	10.2	6.5	2.0	2.0	2.0	172	44	19	8.7	2.8	.8	2.0
22	10.2	6.5	2.0	2.0	2.0	124	36	19	8.7	2.8	2.8	2.0
23	6.5	6.5	2.0	2.0	2.0	102	28	19	8.7	2.8	.8	2.0
24	6.5	6.5	2.0	2.0	2.0	102	28	19	8.7	2.8	.8	2.0
25	6.5	6.5	2.0	2.0	2.0	70	36	19	8.7	2.8	.8	2.0
26	6.5	6.5	2.0	2.0	2.0	70	36	19	8.7	2.8	.8	2.2
27	6.5	6.5	2.0	2.0	2.0	80	36	19	8.7	2.8	.8	2.2
28	6.5	6.5	2.0	2.0	2.0	60	35	19	8.7	.8	1.0	2.2
29	6.5	6.5	2.0	2.0	2.0	51	35	19	8.7	.8	1.0	2.2
30	4.0	4.0	2.0	2.0	-------	42	43	19	8.7	.8	1.0	2.2
31	2.0	-------	2.0	2.0	-------	27	-------	19	-------	.8	1.0	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	15.0	2.0	10.6	652
November	10.2	2.0	5.56	331
December	4.0	2.0	2.52	155
January	2.0	2.0	2.00	123
February	2.0	2.0	2.00	111
March	989	2.0	182	11,200
April	53	28	41.6	2,480
May	43	19	27.4	1,680
June	19	8.7	12.0	714
July	8.4	.8	4.18	257
August	2.8	.6	.76	46.7
September	2.2	.2	1.00	59.5
The year	989	.2	24.6	17,800

Digitized by Google

JAMES RIVER AT HURON, S. DAK.

LOCATION.—Staff gage in sec. 6, T. 110 N., R. 61 W., at Huron. Zero of gage is 1,228.70 feet above mean sea level. Gage moved to new highway bridge just downstream on March 16, 1929.

DRAINAGE AREA.—11,500 square miles.

RECORDS AVAILABLE.—August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 2,110 second-feet Mar. 20 (gage height, 12.0 feet); minimum, 6.5 second-feet Sept. 17–24 (gage height, 0.3 foot).

1928–29: Maximum and minimum discharge, same as given above.

REMARKS.—Records fair. Discharge estimated Oct. 1–29, Nov. 24–28, Aug. 6–16, and 18. Observations discontinued Dec. 2 to Mar. 9. Minor diversions for city water supplies above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		166	82	.....	1,040	962	453	81	18	15.0
2		166	.....	.....	1,040	962	430	74	16	9.5
3		166	.....	.....	1,010	936	430	74	16	16.0
4		166	.....	.....	1,010	936	430	74	16	16.0
5		157	.....	.....	1,030	936	407	74	14	9.5
6	175	157	.....	.....	1,040	936	407	74	14	9.5
7		148	.....	.....	1,040	910	407	74	14	9.5
8		148	.....	.....	1,010	910	384	74	14	9.5
9		148	.....	.....	1,010	910	361	74	14	12.0
10		148	.....	74	1,010	910	361	74	14	13.0
11		148	.....	148	988	884	338	74	15	12.0
12		148	.....	780	1,010	884	269	68	15	11.0
13	170	148	.....	1,530	1,010	832	246	68	15	11.0
14		148	.....	1,740	988	910	247	68	13	9.5
15		166	.....	1,690	988	832	225	68	11	9.5
16	185	176	.....	1,590	988	754	205	68	10	6.6
17	192	176	.....	1,660	1,010	728	185	60	8.3	6.5
18	207	157	.....	1,980	1,010	728	185	48	8.6	6.5
19	207	148	.....	2,060	988	702	185	50	8.8	6.5
20	188	148	.....	2,110	988	650	166	50	9.5	6.5
21	178	148	.....	2,060	988	650	148	48	9.5	6.5
22	170	148	.....	2,030	988	650	148	38	11	6.5
23	166	113	.....	2,000	988	625	139	38	11	6.5
24	166	100	.....	1,740	988	625	130	42	11	6.5
25	162	95	.....	1,690	988	575	148	46	16	9.5
26	162	92	.....	1,510	988	575	139	44	27	12.0
27	164	90	.....	1,350	988	575	94	42	30	12.0
28	165	88	.....	1,250	988	525	89	35	34	12.0
29	165	87	.....	1,140	962	525	89	29	36	12.0
30	166	87	.....	1,120	936	525	89	22	29	12.0
31	166	.....	.....	1,090	.....	477	.....	21	17	.....

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	.....	.....	174	10,700
November	176	87	139	8,270
March 10–31	2,110	74	1,470	64,200
April	1,040	936	1,000	60,000
May	962	477	759	46,700
June	453	89	251	14,900
July	81	21	57.2	3,520
August	36	8.3	16.0	984
September	16	6.5	10.0	595

Digitized by Google

JAMES RIVER NEAR SCOTLAND, S. DAK.

LOCATION.—Chain gage in sec. 30, T. 97 N., R. 57 W., 600 feet above Dawson Creek and 5 miles northeast of Scotland.
DRAINAGE AREA.—15,800 square miles.
RECORDS AVAILABLE.—September, 1928, to September, 1929.
EXTREMES.—Maximum discharge during period of record, 2,970 second-feet Mar. 31 (gage height, 11.92 feet); minimum, 14 second-feet Sept. 16, 1929.
REMARKS.—Records good except those for estimated periods, Nov. 4–24, 26–30, and July 25 to Aug. 17, which are fair. Observations discontinued Dec. 1 to Mar. 9. Operation of water-power plant 20 miles upstream may affect flow slightly.

Daily and monthly discharge, in second-feet, 1928–29

Day	Sept.	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	109	191	176		2,930	1,330	1,210	148		22
2	112	184	176		2,820	1,300	875	134		20
3	109	184	184		2,750	1,240	719	127		19
4	109	184	182		2,640	1,210	623	114		27
5	109	184	180		2,350	1,160	599	103		28
6	109	184	178		2,170	1,130	575	90	75	16
7	112	184	175		1,850	986	552	93		17
8	112	184	172		1,700	1,070	508	95		19
9	109	191	160		1,460	1,040	486	85		21
10	111	184	156	795	1,360	1,010	486	120		17
11	112	184	158	986	1,360	1,010	465	120		16
12	112	184	156	1,130	1,330	986	465	120		16
13	153	184	160	1,180	1,300	930	695	120		16
14	228	191	162	1,300	1,270	902	930	127	50	16
15	262	191	162	1,460	1,270	902	795	245		15
16	266	208	170	1,780	1,240	902	647	302		14
17	185	208	185	2,030	1,240	848	508	264		16
18	180	226	178	2,210	1,210	848	423	191	25	16
19	185	264	170	2,240	1,210	821	362	162	26	20
20	194	236	160	2,350	1,240	795	322	134	28	19
21	235	226	156	2,460	1,240	744	322	127	36	20
22	190	217	152	2,570	1,240	719	322	120	38	19
23	190	200	150	2,600	1,240	719	302	120	38	15
24	182	200	149	2,780	1,360	671	264	120	38	15
25	183	184	148	2,780	1,530	647	245		38	16
26	183	184	140	2,820	1,630	599	217		35	49
27	201	169	136	2,890	1,490	575	169	114	40	53
28	201	176	128	2,930	1,430	695	176		41	30
29	204	176	120	2,930	1,390	1,670	162		41	17
30	201	169	110	2,960	1,360	1,850	162		40	16
31		162		2,960		1,560			30	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1928				
September	266	109	165	9,820
1928–29				
October	264	162	193	11,900
November	185	110	160	9,520
March 10–31	2,960	795	2,190	95,500
April	2,930	1,210	1,620	96,400
May	1,850	575	996	61,200
June	1,210	162	486	28,900
July	302	85	135	8,300
August		25	51.5	3,170
September	53	14	20.5	1,220

Digitized by Google

BIG SIOUX RIVER BASIN

BIG SIOUX RIVER NEAR FLANDREAU, S. DAK.

LOCATION.—Chain gage in sec. 9, T. 107 N., R. 48 W., 2 miles north of Flandreau.
DRAINAGE AREA.—2,520 square miles.
RECORDS AVAILABLE.—August, 1928, to September, 1929.
EXTREMES.—Maximum discharge during year, 5,200 second-feet Mar. 15 (gage height, 14.04 feet); minimum occurred during winter.
1928–29: Maximum and minimum discharge, same as given above.
REMARKS.—Records good. Discharge estimated Nov. 2–6, 17–30, and Sept. 30. Observations discontinued Dec. 1 to Mar. 11. No diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	29	35		245	355	190	22	29	13
2	26	33		235	315	175	20	27	12
3	26	31		220	275	118	20	26	19
4	22	30		212	265	100	17	23	17
5	26	32		205	245	92	18	28	19
6	29	34		198	228	87	21	27	19
7	28	39		190	220	75	27	34	20
8	26	42		182	198	72	23	40	25
9	24	43		175	190	65	20	36	31
10	26	41		153	182	61	18	29	30
11	30	38		132	182	87	17	27	30
12	30	39	1,720	153	168	72	16	26	28
13	29	37	3,540	182	168	69	14	23	27
14	32	38	4,640	198	160	64	16	21	25
15	36	42	5,200	212	160	58	18	19	25
16	38	42	4,260	355	153	52	21	18	25
17	40	40	3,700	615	146	48	24	16	24
18	39	38	3,120	645	139	44	24	16	24
19	41	35	2,520	590	139	41	21	16	22
20	35	30	1,720	490	132	37	25	14	22
21	41	25	995	415	132	35	25	14	22
22	39	20	675	355	122	35	20	12	21
23	38	15	490	315	132	36	41	11	19
24	38	11	415	335	125	35	49	11	18
25	37	11	315	415	111	33	40	14	30
26	36	11	295	615	111	31	37	16	55
27	34	11	275	590	94	28	30	15	68
28	34	11	255	540	99	27	22	15	72
29	34	11	255	490	125	26	35	16	79
30	33	11	245	415	168	25	37	15	78
31	33		245		220		31	15	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	41	22	32.5	2,000
November	43	11	29.2	1,740
March 12–31	5,200	245	1,740	69,000
April	645	132	336	20,000
May	355	94	176	10,800
June	190	25	63.9	3,800
July	49	14	24.8	1,520
August	40	11	20.9	1,290
September	79	10	30.2	1,800

Digitized by Google

BIG SIOUX RIVER AT AKRON, IOWA

LOCATION.—Chain gage in sec. 31, T. 93 N., R. 48 W., at west edge of Akron.
DRAINAGE AREA.—7,080 square miles.
RECORDS AVAILABLE.—October, 1928, to September, 1929.
EXTREMES.—Maximum discharge during year, 14,000 second-feet Mar. 15 (gage height, 18.63 feet); minimum occurred during winter.
REMARKS.—Records good. Discharge estimated Dec. 19–23 and Mar. 11. Observations discontinued Jan. 1 to Mar. 10. No diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	111	268	201	------	1,190	1,620	6,160	424	668	109
2	94	214	188	------	1,110	1,440	4,680	395	575	104
3	125	214	151	------	1,070	1,270	2,420	366	514	132
4	113	214	164	------	1,150	1,230	1,800	352	439	141
5	116	214	151	------	1,110	1,070	1,540	337	439	144
6	111	201	188	------	1,110	1,030	1,360	380	410	164
7	118	227	176	------	1,270	950	1,230	454	352	188
8	106	240	188	------	1,150	870	1,110	337	352	188
9	120	254	139	------	1,190	800	950	366	323	201
10	87	254	164	------	1,150	765	870	484	281	201
11	122	254	139	1,200	1,150	765	835	484	268	188
12	100	227	151	3,220	1,110	732	1,190	575	240	188
13	149	227	188	5,510	1,070	700	2,980	514	268	188
14	125	214	201	8,020	910	700	1,310	484	214	176
15	151	201	227	13,200	1,070	637	1,310	1,150	214	201
16	637	201	201	12,600	1,030	606	1,030	765	201	174
17	1,030	227	164	11,100	1,070	606	910	514	188	171
18	637	201	139	8,520	1,110	575	870	454	176	158
19	439	214	140	7,180	1,110	544	800	395	176	164
20	366	201	140	7,300	1,110	514	700	337	168	156
21	295	201	140	7,180	1,150	575	765	309	171	158
22	281	201	150	6,600	1,190	544	700	281	164	151
23	268	201	170	5,310	1,190	514	700	281	149	141
24	240	201	201	4,120	1,110	484	700	281	134	171
25	240	151	201	3,040	1,140	454	575	910	176	134
26	214	176	201	2,300	1,800	410	575	2,000	168	149
27	227	174	188	1,950	1,900	410	606	2,980	151	214
28	214	201	188	1,720	2,150	544	484	2,580	132	337
29	214	201	176	1,490	2,520	2,690	454	1,400	141	484
30	214	201	176	1,360	1,760	5,610	454	990	125	484
31	214	------	150	1,270	------	6,940	------	800	122	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,030	87	241	14,800
November	268	151	212	12,600
December	227	139	172	10,600
March 11–31	13,200	1,200	5,440	227,000
April	2,520	910	1,270	75,600
May	6,940	410	1,180	72,600
June	6,160	454	1,340	79,700
July	2,980	281	722	44,400
August	668	122	261	16,000
September	484	104	192	11,400

Digitized by Google

LITTLE SIOUX RIVER BASIN

LITTLE SIOUX RIVER AT CORRECTIONVILLE, IOWA

LOCATION.—Chain gage in sec. 34, T. 89 N., R. 42 W., 1,000 feet above Bacon Creek and half a mile west of Correctionville. Prior to July 15, 1929, gage was 1,000 feet downstream.

DRAINAGE AREA.—2,450 square miles.

RECORDS AVAILABLE.—May, 1918, to September, 1924; October, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 6,250 second-feet Mar. 14 (gage height, 16.16 feet); minimum occurred during winter.

1918–1924, 1928–29: Maximum discharge (estimated), 20,700 second-feet Mar. 12, 1919 (gage height, 19.57 feet); minimum, 5 second-feet Aug. 18, 1922.

REMARKS.—Records good. Observations discontinued Dec. 4 to Mar. 9. No diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		160	129		900	1,580	391	801	100	43
2		160	136		834	1,380	575	377	99	43
3		158	121		834	1,180	801	242	93	42
4		150			900	1,070	900	180	86	68
5		152			1,070	968	801	192	92	73
6		160			1,100	867	671	216	91	61
7		203			1,220	801	671	203	86	55
8		282			1,260	735	575	180	80	52
9		320			1,180	671	482	180	75	68
10		332		4,100	1,100	639	451	180	71	77
11		332		4,220	1,070	671	420	170	68	68
12		332		4,340	1,040	703	391	160	88	73
13		319		5,110	1,000	639	363	154	73	74
14		296		6,120	1,000	607	350	160	62	69
15		282		5,740	1,040	544	350	174	58	65
16		268		4,220	1,040	544	768	217	53	61
17		255		4,410	1,070	513	1,860	217	50	57
18		242		5,530	1,070	482	834	198	48	55
19		242		5,530	1,040	420	607	179	49	52
20		216		4,620	1,000	406	513	170	48	52
21		203		3,440	934	391	482	161	48	49
22		192		2,710	900	391	451	152	48	46
23		180		2,310	834	377	420	135	47	45
24		156		1,940	834	391	391	135	47	44
25		139		1,580	1,000	406	363	135	46	43
26		132		1,420	1,140	391	575	135	45	43
27		147		1,260	1,380	377	607	152	43	46
28		170		1,140	1,580	350	377	135	43	47
29	138	152		1,070	1,680	336	332	128	43	49
30	129	139		1,000	1,720	332	319	120	42	55
31	122			934		336		113	45	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
November	332	132	216	12,900
March 10–31	6,120	934	3,310	144,000
April	1,720	834	1,090	64,900
May	1,580	332	629	38,700
June	1,860	319	570	33,900
July	801	113	195	12,000
August	100	42	63.5	3,900
September	77	43	55.8	3,320

Digitized by Google

PLATTE RIVER BASIN

GRIZZLY CREEK NEAR WALDEN, COLO.

LOCATION.—Water-stage recorder in sec. 29, T. 8 N., R. 80 W., half a mile above Little Grizzly Creek and 10 miles south of Walden.

DRAINAGE AREA.—234 square miles.

RECORDS AVAILABLE.—May, 1904, to October, 1905; May to September, 1923; October, 1926, to September, 1929.

EXTREMES.—Maximum discharge during year, 731 second-feet May 17 (gage height, 4.40 feet); minimum occurred during winter.

1904–5, 1923, 1926–1929: Maximum discharge, 1,340 second-feet June 10, 1923 (gage height, 4.8 feet); minimum, 1 second-foot Aug. 24–28, 1905.

REMARKS.—Records good except those for estimated periods, which are fair. Observations discontinued Nov. 5 to May 11. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29.

Day	Oct.	Nov.	May	June	July	Aug.	Sept.
1	16	25	-------	329	164	85	31
2	16	25	-------	362	136	96	31
3	14	25	-------	388	119	80	37
4	14	18	-------	362	102	62	40
5	16	-------	-------	355	106	56	*52
6	17	-------	-------	355	88	74	*70
7	17	-------	-------	375	66	122	89
8	17	-------	-------	365	54	91	124
9	17	-------	-------	385	46	66	112
10	18	-------	-------	402	41	58	96
11	17	-------	-------	402	38	52	89
12	17	-------	234	392	37	*50	77
13	17	-------	331	398	36	*48	65
14	14	-------	428	370	35	*46	*68
15	14	-------	526	350	37	*44	71
16	18	-------	642	358	46	*42	68
17	23	-------	653	329	45	*52	66
18	22	-------	547	412	45	*60	63
19	22	-------	588	348	43	*55	60
20	25	-------	523	271	41	*50	59
21	23	-------	550	264	38	*48	59
22	22	-------	552	255	33	*45	56
23	21	-------	515	259	45	*42	*62
24	20	-------	563	257	70	*40	*76
25	20	-------	512	248	51	*38	*80
26	22	-------	520	225	86	*34	*52
27	24	-------	528	205	85	*30	*38
28	24	-------	481	189	62	29	*31
29	22	-------	507	174	57	38	31
30	25	-------	402	168	55	39	31
31	26	-------	322	-------	50	36	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	26	14	19.4	1,190
May 12–31	653	234	496	19,700
June	412	168	318	18,900
July	164	33	63.1	3,880
August	122	29	55.1	3,390
September	124	31	62.9	3,740

* Estimated.

Digitized by Google

NORTH PLATTE RIVER NEAR WALDEN, COLO.

LOCATION.—Water-stage recorder in sec. 5, T. 8 N., R. 80 W., 8 miles southwest of Walden.

DRAINAGE AREA.—446 square miles.

RECORDS AVAILABLE.—May, 1904, to October, 1905; October, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, 1,530 second-feet June 28 (gage height, 4.72 feet); minimum occurred during winter.

1904–5, 1923–1929: Maximum discharge, 1,930 second-feet June 1, 1928 (gage height, 5.33 feet); minimum, 15 second-feet Sept. 13–18, 1905.

REMARKS.—Records good except those for estimated periods, which are fair. Observations discontinued Nov. 18 to Apr. 20. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29.

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	50	58	-------	*330	*740	1,180	285	106
2	47	*60	-------	*340	790	*1,080	273	97
3	43	*60	-------	*350	815	*960	246	97
4	41	*60	-------	359	815	*870	226	126
5	43	*64	-------	359	865	*850	223	159
6	46	66	-------	373	940	*760	*270	204
7	46	*66	-------	439	1,020	625	380	232
8	45	*65	-------	580	1,040	527	257	*290
9	48	*65	-------	670	1,120	419	210	*250
10	43	65	-------	*780	1,230	352	179	*215
11	40	*65	-------	*860	1,260	325	150	*205
12	40	*65	-------	*810	1,200	300	138	196
13	41	*66	-------	*780	1,200	303	130	196
14	41	66	-------	*940	*1,160	345	132	191
15	45	58	-------	1,260	*1,140	306	122	189
16	54	*58	-------	1,260	1,120	309	119	186
17	59	*56	-------	1,150	1,200	312	119	184
18	56	-------	-------	1,150	1,400	366	140	165
19	54	-------	-------	1,060	1,020	270	126	138
20	56	-------	-------	1,060	790	223	122	120
21	56	-------	670	1,090	840	212	117	124
22	56	-------	580	1,060	990	240	130	126
23	53	-------	580	*1,040	1,200	210	119	138
24	51	-------	566	*1,110	1,400	345	109	182
25	48	-------	390	*1,180	1,340	294	108	182
26	55	-------	342	1,260	1,340	249	99	159
27	61	-------	356	1,230	1,400	315	97	140
28	62	-------	373	1,040	1,460	261	96	130
29	69	-------	*440	1,040	1,400	235	97	130
30	71	-------	*380	790	1,400	235	101	130
31	74	-------	-------	*660	-------	232	108	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	74	40	51.4	3,160
November 1–17	66	56	62.5	2,120
April 21–30	670	342	468	9,280
May	1,260	330	852	52,400
June	1,460	740	1,120	66,600
July	1,180	210	436	26,800
August	380	96	163	10,000
September	290	97	166	9,880

* Estimated.

Digitized by Google

LOCATION.—Water-stage recorder in sec. 11, T. 11 N., R. 80 W., 6 miles south of Colorado-Wyoming line and 6 miles northwest of Northgate.

DRAINAGE AREA.—1,440 square miles.

RECORDS AVAILABLE.—May, 1915, to September, 1929.

EXTREMES.—Maximum discharge during year, 3,550 second-feet June 12 (gage height, 4.55 feet); minimum occurred during winter.

1915–1929: Maximum discharge, 6,720 second-feet June 11, 1923 (gage height, 6.24 feet); minimum, 67 second-feet Oct. 7 and 20, 1922 (gage height, 1.17 feet).

REMARKS.—Records good. Discharge estimated Oct. 13–15, July 28, and 29. Observations discontinued Nov. 1 to Apr. 25. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct	Apr	May	June	July	Aug.	Sept.
1	121	------	1,790	1,620	2,470	810	314
2	112	------	1,170	1,730	2,320	785	286
3	106	------	952	2,040	1,970	704	277
4	108	------	962	2,170	1,790	665	318
5	114	------	944	2,320	1,680	688	414
6	121	------	914	2,470	1,620	735	614
7	121	------	1,070	2,640	1,400	961	681
8	121	------	1,620	2,720	1,200	876	885
9	121	------	2,100	2,890	1,070	673	990
10	119	------	2,390	3,070	895	551	876
11	119	------	2,320	3,360	768	480	752
12	119	------	1,480	3,450	712	449	681
13	130	------	1,470	3,450	681	397	600
14	155	------	1,850	3,160	735	364	564
15	180	------	2,320	2,980	785	323	537
16	199	------	2,720	2,980	760	304	530
17	203	------	2,720	2,890	744	299	510
18	210	------	2,470	3,260	838	337	467
19	214	------	2,170	2,390	777	353	430
20	206	------	1,970	1,850	727	332	397
21	214	------	1,910	1,850	704	309	375
22	206	------	1,970	2,040	688	332	375
23	180	------	1,970	2,240	643	348	397
24	167	------	2,100	2,470	600	323	443
25	167	------	2,320	2,390	643	304	461
26	177	1,040	2,550	2,240	600	309	426
27	199	971	2,980	2,240	592	295	397
28	203	990	3,160	2,320	600	299	364
29	210	1,460	3,360	2,240	680	332	353
30	210	2,040	2,470	2,390	768	318	353
31	210	------	1,850	------	735	314	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	214	106	163	10,000
April 26–30	2,040	971	1,300	12,900
May	3,360	914	2,000	123,000
June	3,450	1,620	2,530	151,000
July	2,470	592	1,010	62,100
August	981	295	471	29,000
September	990	277	502	29,900

Digitized by Google

NORTH PLATTE RIVER AT SARATOGA, WYO.

LOCATION.—Chain gage in sec. 14, T. 17 N., R. 84 W., at Saratoga. Zero of gage is 6,773.8 feet above mean sea level.

DRAINAGE AREA.—2,880 square miles.

RECORDS AVAILABLE.—June, 1903, to October, 1906; April to December, 1909; April, 1911, to September, 1929.

EXTREMES.—Maximum discharge during year, 10,600 second-feet June 11 (gage height, 9.10 feet); minimum occurred during winter.

1903–1906, 1909, 1911–1929: Maximum discharge, about 18,000 second-feet June 8, 1909 (gage height, 11.06 feet); minimum, 87 second-feet Sept. 7, 1924.

REMARKS.—Records good except those for periods of ice effect, Nov. 19–30, Dec. 3 to Mar. 1, Mar. 15–20, 22, and 25–28, which are fair. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	266	504	310			315	702	2,800	5,120	6,370	1,260	546
2	266	435	294			333	621	2,040	6,100	6,100	1,260	546
3	276	415		289	272	328	835	1,720	6,370	5,350	1,140	546
4	299	421	271			328	1,140	1,650	6,640	4,460	1,140	702
5	330	448				328	1,320	1,650	7,180	4,020	1,140	790
6	304	462				328	1,080	1,580	7,750	3,800	1,380	882
7	299	518				333	882	1,650	8,330	3,380	1,720	1,080
8	299	533	253	280	262	414	835	2,450	8,620	2,990	1,440	1,260
9	309	547				458	930	2,990	9,230	2,620	1,140	1,440
10	304	518				485	835	3,590	9,550	2,280	1,080	1,380
11	299	518				452	745	3,180	10,200	1,960	930	1,260
12	299	511				377	882	3,180	9,880	1,960	835	1,200
13	299	525	255	272	260	308	980	2,800	8,920	1,800	745	1,080
14	324	518				313	1,140	3,380	9,230	1,800	702	930
15	408	504				303	1,650	4,240	9,550	1,800	660	835
16	475	468				308	2,280	5,120	9,880	1,800	582	790
17	475	385				313	4,680	5,120	9,230	1,800	582	835
18	489	362	272	271	267	323	6,370	5,350	8,040	1,800	546	745
19	489	350				333	6,370	5,120	7,460	1,720	745	702
20	497	350				328	5,350	5,350	6,910	1,650	702	660
21	504					371	4,020	5,350	6,370	1,440	621	660
22	489					355	2,620	5,590	6,640	1,380	582	702
23	497	350	270	264	265	355	2,280	6,370	7,180	1,260	582	745
24	489					344	2,450	6,910	6,640	1,260	582	882
25	462					333	1,880	7,750	6,640	1,200	582	835
26	455					323	1,650	8,330	6,370	1,140	546	882
27	462				295	339	1,510	7,180	6,640	1,140	511	835
28	475	325	300	253		395	1,580	6,910	6,640	1,140	511	702
29	489					504	1,960	6,370	6,640	1,080	546	745
30	475					902	2,800	5,590	6,100	1,080	582	702
31	511					568		5,120		1,140	582	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	511	266	397	24,400
November	547		422	25,100
December	310		273	16,800
January			271	16,700
February			268	14,900
March	902	303	381	23,400
April	6,370	621	2,080	124,000
May	8,330	1,580	4,400	271,000
June	10,200	5,120	7,670	456,000
July	6,370	1,080	2,350	144,000
August	1,720	511	836	51,400
September	1,440	546	863	51,400
The year	10,200		1,680	1,220,000

Digitized by Google

NORTH PLATTE RIVER ABOVE PATHFINDER RESERVOIR, WYO.

LOCATION.—Water-stage recorder in sec. 27, T. 86 N., R. 84 W., 900 feet below mouth of Lost Creek and 2½ miles above upper end of Pathfinder Reservoir.
DRAINAGE AREA.—7,410 square miles.
RECORDS AVAILABLE.—October, 1913, to September, 1925; June to September, 1929.
EXTREMES.—Maximum discharge during year (estimated), 12,800 second-feet June 13; minimum, 570 second-feet Aug. 25 and 28 (gage height, 1.32 feet). 1913–1925, 1929: Maximum discharge, 18,800 second-feet June 26, 1917 (gage height, 6.2 feet); minimum, 72 second-feet Nov. 14, 1922.
REMARKS.—Records good except those for estimated period, June 1–17, which are fair. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1929

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.
1	6,200	8,410	1,120	644	16	12,200	2,100	775	1,060
2	6,400	8,460	1,150	653	17	12,400	2,000	716	974
3	6,700	7,540	1,290	635	18	12,500	1,940	680	913
4	7,200	6,770	1,290	825	19	11,500	1,960	653	858
5	7,700	5,990	1,210	825	20	10,500	2,020	627	815
6	8,200	5,350	1,180	847	21	9,480	2,020	635	775
7	8,700	4,830	1,210	935	22	8,560	1,760	662	725
8	9,200	4,300	1,560	1,010	23	8,660	1,580	635	716
9	9,800	3,770	1,700	1,150	24	8,970	1,520	578	755
10	10,500	3,250	1,510	1,310	25	9,120	1,460	570	805
11	11,400	2,910	1,260	1,460	26	8,970	1,420	578	913
12	12,000	2,750	1,080	1,460	27	8,760	1,390	578	961
13	12,600	2,260	1,000	1,400	28	8,810	1,320	570	1,000
14	12,200	2,080	924	1,270	29	8,610	1,240	735	987
15	11,900	2,140	847	1,170	30	8,710	1,200	586	935
					31		1,150	578	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
June	12,600	6,200	9,620	572,000
July	8,460	1,150	3,130	192,000
August	1,700	570	919	56,500
September	1,460	635	960	57,100
The period				878,000

Digitized by Google

NORTH PLATTE RIVER BELOW PATHFINDER RESERVOIR, WYO.

LOCATION.—Chain gage in sec. 24, T. 29 N., R. 84 W., a quarter of a mile below Pathfinder Dam.
DRAINAGE AREA.—10,700 square miles.
RECORDS AVAILABLE.—May, 1905, to September, 1929.
EXTREMES.—Since completion of reservoir: Maximum discharge, 18,900 second-feet June 25–27, 1917; no flow Nov. 23, 1928.
REMARKS.—Flow regulated by Pathfinder Reservoir. Complete records furnished by United States Bureau of Reclamation.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug	Sept.
1	2,000	50	75	75	75	100	75	75	9,520	8,200	6,050	6,030
2	2,000	50	75	75	75	100	75	75	9,220	8,120	6,040	6,000
3	1,980	50	75	75	75	100	75	75	8,840	7,990	6,010	6,070
4	1,980	50	75	75	75	100	75	75	8,660	7,700	6,040	6,070
5	2,070	50	120	75	75	100	75	75	8,700	7,250	6,070	5,700
6	2,070	50	120	75	75	100	75	75	8,830	6,780	6,050	5,550
7	2,070	50	120	75	75	75	75	75	9,020	6,330	6,010	5,530
8	2,070	50	95	75	75	75	75	75	9,290	5,620	5,990	4,420
9	2,070	50	75	75	75	75	75	75	9,570	5,340	6,010	4,010
10	2,070	50	75	75	75	75	130	75	9,810	4,910	6,010	4,040
11	2,070	50	75	75	75	75	160	75	10,100	4,490	5,600	2,260
12	2,070	50	75	75	75	75	160	75	11,600	4,040	5,500	2,020
13	2,070	50	75	75	75	75	160	75	11,900	3,620	5,540	2,020
14	2,070	50	75	75	75	200	60	75	12,200	3,280	5,520	2,010
15	2,070	50	75	75	110	75	60	75	12,200	3,000	5,480	2,010
16	150	50	75	75	130	75	60	75	12,000	2,820	5,540	2,010
17	50	50	75	75	100	75	60	75	11,800	2,640	5,550	2,020
18	50	50	75	75	100	75	60	75	11,500	2,500	5,550	2,020
19	50	50	75	75	100	75	75	75	11,400	2,420	5,540	2,020
20	50	80	75	75	100	75	75	75	11,200	5,540	5,520	2,020
21	50	80	75	75	100	75	75	50	10,600	6,100	5,500	2,020
22	50	80	75	75	100	75	75	170	9,960	7,510	5,480	2,020
23	50	0	75	75	100	75	75	1,410	9,390	7,400	5,480	2,030
24	50	155	75	75	100	75	75	3,960	9,030	7,340	5,470	2,030
25	50	75	75	75	100	75	75	3,860	8,860	6,100	5,550	2,030
26	50	75	75	75	100	75	75	5,560	8,750	6,030	5,540	4,490
27	50	75	75	75	100	75	75	7,140	8,620	6,010	5,520	5,980
28	50	75	75	75	100	75	75	8,250	8,520	5,960	5,490	5,960
29	50	75	75	75	------	75	75	9,140	8,430	6,050	5,910	5,920
30	50	75	75	75	------	75	75	9,730	8,310	6,030	6,070	5,890
31	50	------	75	75	------	75	------	9,800	------	5,990	6,060	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2,070	50	1,020	62,700
November	155	0	59.8	3,560
December	120	75	80.0	4,920
January	75	75	75.0	4,610
February	130	75	88.9	4,940
March	200	75	83.9	5,160
April	160	60	83.8	4,990
May	9,800	75	1,950	120,000
June	12,200	8,310	9,930	591,000
July	8,200	2,420	5,580	343,000
August	6,070	5,470	5,730	352,000
September	6,070	2,010	3,740	223,000
The year	12,200	0	2,380	1,720,000

Digitized by Google

NORTH PLATTE RIVER AT CASPER, WYO.

LOCATION.—Chain gage in sec. 4, T. 33 N., R. 79 W., at Casper, 1½ miles below mouth of Casper creek. Staff gage 300 feet upstream used June 10 to July 11 and July 27 to August 5, 1929.
DRAINAGE AREA.—12,500 square miles.
RECORDS AVAILABLE.—May to September, 1929.
EXTREMES.—Maximum discharge during period, 13,800 second-feet May 30 (gage height, 8.00 feet); minimum (estimated), 250 second-feet May 3.
REMARKS.—Records fair prior to June 30 and good thereafter. Discharge estimated May 1–6. Flow regulated by Pathfinder Reservoir.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1	300	11,100	8,870	6,220	6,260	16	570	12,500	3,060	5,740	2,120
2	260	10,900	8,690	6,220	6,240	17	468	12,500	2,810	5,740	2,090
3	250	9,650	8,490	6,280	6,290	18	523	12,100	2,780	5,820	2,090
4	280	8,900	8,090	6,320	6,310	19	392	12,100	2,490	5,780	2,060
5	320	9,150	7,570	6,320	5,690	20	345	12,100	6,060	5,740	2,110
6	300	9,780	7,070	6,220	5,740	21	296	11,200	6,450	5,740	2,090
7	303	9,150	6,450	6,220	5,650	22	296	10,500	7,940	5,740	2,090
8	284	9,400	5,810	6,200	4,580	23	738	9,860	7,820	5,690	2,150
9	309	10,000	5,760	6,240	4,010	24	4,880	9,440	7,820	5,690	2,140
10	338	10,800	5,040	6,200	4,110	25	8,690	9,350	6,520	5,740	2,180
11	345	11,000	4,520	5,690	2,240	26	4,670	9,470	6,290	5,840	4,410
12	330	11,700	4,050	5,620	2,090	27	7,400	9,440	6,400	5,740	6,150
13	322	12,300	3,950	5,600	2,030	28	9,400	9,170	6,120	5,740	6,180
14	353	12,500	3,660	5,650	2,030	29	12,500	9,110	6,220	6,290	6,240
15	486	12,700	3,260	5,620	2,090	30	12,800	8,930	6,180	6,240	6,200
						31	11,200	------	6,180	6,310	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May	12,800	250	2,420	149,000
June	12,700	8,900	10,600	631,000
July	8,870	2,490	5,880	362,000
August	6,320	5,600	5,940	365,000
September	6,310	2,030	3,860	230,000
The period				1,740,000

Digitized by Google

NORTH PLATTE RIVER AT DOUGLAS, WYO.

LOCATION.—Chain gage in sec. 5, T. 32 N., R. 71 W., at highway bridge half a mile northwest of Douglas.
DRAINAGE AREA.—14,200 square miles.
RECORDS AVAILABLE.—April to September, 1929.
EXTREMES.—Maximum discharge during period, 13,800 second-feet May 30 (gage height, 7.62 feet); minimum, 450 second-feet Apr. 13 (gage height, 1.72 feet).
REMARKS.—Records good except those for estimated period, Apr. 1–6, which are fair. Flow regulated by Pathfinder Reservoir.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	750	1,600	11,800	8,390	5,970	5,970	16	520	2,630	13,300	3,130	5,280	2,160
2	750	1,360	11,400	8,100	5,970	5,730	17	610	2,630	12,900	2,960	5,500	2,160
3	800	1,300	10,300	8,100	5,970	5,970	18	790	2,470	12,500	2,790	5,730	2,160
4	800	1,420	9,620	7,810	5,970	5,970	19	946	2,470	12,200	2,630	5,280	2,160
5	850	1,600	9,620	7,530	5,970	5,970	20	914	2,470	11,800	3,500	5,280	2,160
6	900	1,540	9,960	6,980	5,970	6,460	21	904	2,310	10,700	5,500	5,280	2,160
7	977	1,420	9,960	6,460	6,210	5,970	22	904	2,310	10,700	5,730	5,280	2,160
8	760	1,540	9,960	5,970	5,970	5,280	23	935	2,160	9,960	6,980	5,280	2,160
9	650	1,660	9,960	5,970	5,730	4,270	24	977	2,310	9,300	6,980	5,280	2,160
10	650	1,870	10,700	5,280	5,730	4,070	25	851	4,270	8,690	6,460	5,280	2,160
11	580	1,940	11,400	4,870	5,970	4,070	26	851	5,970	8,690	5,970	5,280	2,160
12	470	2,010	12,200	4,670	5,500	2,630	27	862	7,530	8,100	5,970	5,280	5,070
13	450	2,010	12,900	4,070	5,500	2,470	28	946	8,690	8,390	5,730	5,280	5,500
14	460	2,160	13,300	3,880	5,280	2,310	29	1,120	11,000	8,390	5,730	5,280	5,500
15	480	2,630	13,300	4,270	5,280	2,160	30	1,480	13,700	8,390	5,970	5,970	5,730
							31		12,200		5,730	5,970	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April	1,480	450	798	47,500
May	13,700	1,300	3,590	221,000
June	13,300	8,100	10,700	637,000
July	8,390	2,630	5,620	346,000
August	6,210	5,280	5,600	344,000
September	6,460	2,160	3,830	228,000
The period				1,820,000

Digitized by Google

NORTH PLATTE RIVER BELOW GUERNSEY RESERVOIR, WYO.

LOCATION.—Water-stage recorder in sec. 35, T. 27 N., R. 66 W., three-fourths mile below Guernsey Dam and 1 mile northwest of Guernsey.
DRAINAGE AREA.—16,200 square miles.
RECORDS AVAILABLE.—June, 1900, to November, 1908; March to October, 1912; January, 1928, to September, 1929.
REMARKS.—Flow regulated by Pathfinder and Guernsey Reservoirs. Complete records furnished by United States Bureau of Reclamation.

Daily and monthly discharge, in second-feet, 1928-29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,580	350	350	315	371	310	1,080	885	14,100	7,450	5,750	5,650
2	2,600	450	280	410	377	337	1,180	1,040	14,000	7,530	5,300	5,650
3	2,360	470	370	430	294	272	1,200	1,210	13,600	7,250	5,150	5,750
4	1,770	400	380	405	376	313	1,210	1,320	10,700	7,050	5,200	5,780
5	1,800	550	400	397	390	294	1,200	1,300	9,740	7,100	5,200	5,700
6	1,670	500	390	375	359	294	1,190	1,480	10,200	6,850	5,150	4,600
7	1,840	475	415	400	373	295	1,080	2,400	10,300	6,650	5,200	3,850
8	1,530	490	390	390	335	336	1,120	2,380	10,600	6,350	5,220	3,650
9	1,500	512	315	370	323	337	1,150	2,500	11,000	6,300	5,080	3,680
10	1,570	555	345	375	293	257	1,100	2,580	12,200	4,830	5,080	3,680
11	1,400	486	350	380	322	280	1,120	3,720	12,400	5,350	5,480	3,480
12	1,180	495	365	350	321	750	1,090	2,800	12,300	5,400	5,950	3,380
13	1,290	573	375	285	326	1,150	1,140	3,000	12,400	5,450	5,780	3,300
14	1,300	630	398	344	321	1,520	1,030	2,950	13,000	6,150	5,780	3,220
15	1,180	600	400	365	321	1,880	1,080	3,000	13,300	5,600	5,800	3,080
16	1,000	515	355	385	298	2,180	1,070	3,580	13,600	5,600	5,820	2,980
17	430	540	375	345	278	2,230	1,030	4,380	13,700	5,550	5,750	3,320
18	300	450	440	360	366	2,220	1,050	4,700	13,200	5,600	5,580	3,250
19	310	575	480	360	356	1,850	1,060	4,580	13,000	5,300	5,580	3,250
20	600	550	450	340	345	1,820	1,040	4,380	11,200	4,990	5,540	3,150
21	350	645	427	440	342	1,850	925	3,880	10,000	4,400	5,540	3,080
22	380	560	425	431	320	1,760	1,040	3,880	10,600	4,700	5,520	3,000
23	440	445	376	440	323	1,760	1,060	3,850	10,600	5,250	5,550	3,320
24	500	410	415	403	272	1,420	975	3,850	9,700	5,750	5,550	3,400
25	420	345	340	343	318	840	1,020	3,650	8,000	6,300	5,600	3,250
26	380	350	380	371	290	1,860	1,060	3,400	7,800	6,150	5,650	3,050
27	350	400	413	292	265	1,720	1,120	4,450	8,000	6,100	5,650	3,550
28	330	380	400	382	318	1,640	1,800	6,950	7,900	6,150	5,450	5,700
29	340	280	400	381	------	615	1,820	10,600	7,700	6,200	5,580	8,300
30	380	340	325	380	------	310	560	11,200	7,200	6,280	5,700	6,550
31	280	------	400	373	------	490	------	12,000	------	6,050	5,750	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2,600	280	1,040	64,000
November	645	280	478	28,400
December	427	280	384	23,600
January	440	285	375	23,100
February	377	265	328	18,200
March	2,230	272	1,070	65,800
April	1,820	560	1,120	66,600
May	12,000	885	3,930	242,000
June	14,100	7,200	11,100	660,000
July	7,530	4,400	5,990	368,000
August	5,950	5,080	5,510	339,000
September	5,780	2,980	4,120	245,000
The year	14,100	265	2,960	2,140,000

Digitized by Google

NORTH PLATTE RIVER BELOW WHALEN, WYO.

LOCATION.—In sec. 11, T. 26 N., R. 65 W.; at diversion dam at Whalen, 7 miles below Guernsey Dam.
DRAINAGE AREA.—16,300 square miles.
RECORDS AVAILABLE.—May, 1909, to September, 1929.
REMARKS.—Discharge below Whalen obtained by deducting flow of Interstate and Fort Laramie Canals from flow of North Platte River below Guernsey Reservoir. Flow of canals is computed from gate openings. Complete records furnished by United States Bureau of Reclamation.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	721	350	350	315	321	216	1,060	103	11,700	3,380	2,230	2,040
2	789	450	280	410	330	261	1,180	190	12,000	3,930	1,710	2,070
3	710	470	370	430	244	217	1,200	280	11,800	3,660	1,570	2,180
4	465	400	380	405	326	226	1,210	370	8,940	3,420	1,610	2,240
5	695	550	400	397	344	208	1,200	350	7,910	3,450	1,590	2,240
6	565	500	390	375	322	294	1,190	517	8,440	3,180	1,560	1,560
7	760	475	415	400	327	295	1,080	1,440	8,540	2,980	1,620	1,750
8	483	490	390	390	205	290	1,120	1,420	8,860	2,690	1,680	1,600
9	485	512	315	370	227	292	1,150	1,460	9,300	2,630	1,500	1,800
10	649	555	345	375	212	232	1,100	1,620	10,400	2,330	1,490	1,830
11	507	486	350	380	217	280	1,120	2,760	10,500	1,740	1,880	1,610
12	314	495	365	350	206	750	1,090	1,760	10,200	1,750	2,360	1,640
13	397	573	375	285	225	1,150	1,140	1,950	10,200	1,810	2,200	1,580
14	407	630	398	344	210	1,520	1,030	1,890	10,800	2,720	2,160	1,500
15	287	600	400	365	232	1,880	1,080	1,860	11,000	1,960	2,180	1,340
16	160	515	355	385	223	2,180	940	2,420	11,200	1,960	2,200	1,330
17	69	540	375	345	209	2,230	530	3,050	11,100	1,910	2,130	1,770
18	300	450	440	360	332	2,220	450	3,310	10,500	1,960	1,950	1,730
19	310	575	480	360	238	1,850	460	3,290	10,200	1,650	1,950	1,730
20	600	550	450	340	247	1,820	640	2,990	8,250	1,350	1,910	1,580
21	350	645	427	440	226	1,850	525	2,390	7,030	760	1,930	1,440
22	380	560	425	431	235	1,760	590	2,340	7,520	1,060	1,920	1,320
23	440	445	376	440	250	1,760	560	2,310	7,410	1,610	1,950	1,580
24	500	410	415	172	214	1,420	892	2,130	6,520	2,110	1,930	1,550
25	420	345	340	258	235	840	1,020	1,780	4,830	2,660	1,980	1,400
26	380	350	380	280	190	1,060	660	1,510	4,520	2,540	2,020	1,230
27	350	400	413	232	182	1,720	620	2,480	4,690	2,490	2,020	1,720
28	330	380	400	336	236	1,640	1,300	4,910	4,490	2,580	1,820	3,880
29	340	280	400	336	-------	615	1,290	8,450	4,230	2,660	1,950	6,640
30	380	340	325	330	-------	310	23	9,000	3,660	2,780	2,070	5,080
31	280	-------	400	329	-------	490	-------	9,690	--------	2,510	2,110	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	789	69	446	27,400
November	645	280	477	28,400
December	480	280	385	23,700
January	440	172	354	21,800
February	344	182	249	13,800
March	2,230	208	1,050	64,600
April	1,300	23	915	54,500
May	9,690	103	2,580	159,000
June	12,000	3,660	8,560	509,000
July	3,930	760	2,410	148,000
August	2,360	1,490	1,910	117,000
September	6,640	1,230	2,030	121,000
The year	12,000	23	1,780	1,290,000

Digitized by Google

NORTH PLATTE RIVER AT WYOMING-NEBRASKA LINE

LOCATION.—Chain gage in sec. 10, T. 23 N., R. 60 W., one-fourth mile west of Wyoming-Nebraska line and 1 mile southwest of Henry. Mitchell Canal diverts 500 feet above and Gering Canal 1,900 feet below gage.

DRAINAGE AREA.—22,100 square miles.

RECORDS AVAILABLE.—April to September, 1929.

EXTREMES.—Maximum discharge during period, about 17,900 second-feet June 2 (gage height, 6.04 feet); minimum, 1,460 second-feet Apr. 27 (gage height, 2.10 feet).

REMARKS.—Records good. Discharge estimated Apr. 28. Large diversions for irrigation above station. Flow regulated by Pathfinder and Guernsey Reservoirs.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	1,800	15,800	5,560	2,820	2,450	16	------	3,770	11,800	2,940	2,120	1,880
2	------	1,890	17,600	5,780	2,630	2,330	17	------	4,670	11,700	2,820	2,280	1,880
3	------	1,760	16,000	5,560	2,230	2,480	18	------	5,150	11,700	2,940	1,970	2,030
4	------	1,710	15,300	5,090	2,090	2,330	19	------	5,720	10,800	2,920	1,990	2,140
5	------	1,990	11,800	4,810	1,860	2,400	20	------	5,520	10,100	2,900	2,050	1,920
6	------	1,970	11,200	4,850	1,990	2,700	21	------	4,610	8,000	2,610	1,970	1,920
7	------	2,130	10,700	4,850	1,970	3,320	22	------	4,050	8,000	1,910	1,900	1,800
8	------	2,900	10,500	4,450	1,990	2,900	23	------	3,800	8,830	1,880	1,860	1,690
9	------	3,070	10,500	4,090	2,050	2,820	24	------	3,880	8,880	2,000	1,990	1,800
10	------	3,360	10,400	4,780	1,840	2,700	25	------	3,410	7,240	2,500	2,080	1,800
11	------	3,440	11,700	3,170	1,780	2,600	26	2,090	3,170	5,830	3,250	2,100	1,710
12	------	3,570	10,700	2,730	1,900	2,330	27	1,460	3,000	5,720	2,940	2,210	1,610
13	------	3,680	10,900	2,630	2,430	2,280	28	1,880	4,110	5,600	3,170	2,360	1,950
14	------	3,880	11,100	2,940	2,280	2,190	29	2,300	7,960	5,520	3,000	2,310	4,330
15	------	3,770	11,400	3,140	2,260	2,210	30	2,470	12,800	5,560	3,120	2,430	6,460
							31	------	13,700	------	3,000	2,360	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 26–30	2,470	1,460	2,040	20,200
May	13,700	1,710	4,200	258,000
June	17,600	5,520	10,400	619,000
July	5,780	1,880	3,490	215,000
August	2,820	1,780	2,130	131,000
September	6,460	1,610	2,430	145,000
The period	----------	----------	----------	1,390,000

Digitized by Google

PLATTE RIVER NEAR DUNCAN, NEBR.

LOCATION.—Staff gage in sec. 12, T. 16 N., R. 2 W., 1½ miles south of Duncan. Zero of gage is 1,478.7 feet above mean sea level.

DRAINAGE AREA.—61,600 square miles.

RECORDS AVAILABLE.—October, 1928, to September, 1929. June, 1895, to September, 1915, at point 7 miles downstream.

EXTREMES.—Maximum discharge during year, 28,200 second-feet June 9 (gage height, 5.03 feet); minimum, 3 second-feet Sept. 2 and 3.

REMARKS.—Records good. Observations discontinued Dec. 1 to Mar. 12. Numerous diversions from headwaters. Flow partly regulated by reservoirs in Wyoming.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	------	4,000	------	4,940	5,630	7,960	4,570	136	9
2	------	5,880	------	4,940	5,880	8,170	4,360	56	3
3	------	4,460	------	4,210	5,560	6,240	4,830	29	3
4	------	3,220	------	4,070	5,630	5,340	4,570	19	9
5	------	3,790	------	4,680	4,650	4,410	3,130	16	9
6	------	4,980	------	4,570	4,560	8,530	3,170	16	9
7	------	4,000	------	4,020	4,700	16,800	2,550	12	9
8	------	3,590	------	3,540	5,380	21,900	2,120	12	14
9	------	3,790	------	3,080	5,560	26,500	2,550	12	25
10	------	4,700	------	3,450	6,920	21,500	2,120	12	16
11	------	4,460	------	3,310	10,400	19,100	2,060	12	12
12	------	4,220	------	3,360	7,760	14,600	2,720	12	39
13	------	3,790	19,000	3,400	6,170	12,000	2,480	10	1,450
14	------	3,390	11,600	3,080	5,500	11,400	2,230	10	1,980
15	------	3,040	11,600	3,360	4,760	9,780	1,690	12	2,480
16	------	3,040	8,460	3,470	4,860	9,370	1,890	5	2,950
17	------	3,220	7,070	4,360	5,140	9,370	1,600	4	3,040
18	------	3,220	5,220	4,090	4,700	9,960	1,510	5	2,850
19	------	3,220	4,410	4,050	4,320	9,600	1,380	5	2,670
20	------	3,390	3,450	4,270	4,130	11,700	1,470	9	2,670
21	------	3,390	2,990	4,270	4,460	9,600	1,730	5	2,760
22	------	3,040	2,990	4,980	4,600	9,210	1,240	7	2,760
23	------	3,040	3,450	5,030	4,410	9,600	974	5	2,790
24	------	3,220	4,680	5,030	4,510	9,440	846	4	2,670
25	2,320	3,220	4,680	4,920	4,400	8,900	858	5	2,590
26	2,180	3,220	4,940	12,500	5,750	8,460	522	4	2,560
27	1,930	3,220	4,940	9,160	6,380	7,540	266	4	2,620
28	2,060	3,040	5,220	11,100	5,630	6,490	118	10	2,950
29	2,320	3,220	5,810	8,490	4,940	5,340	122	5	3,280
30	2,590	3,040	5,220	6,840	4,070	4,310	180	4	2,730
31	2,880	------	5,220	------	6,420	------	97	5	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October 26–31	2,880	1,930	2,330	32,300
November	5,880	3,040	3,640	217,000
March 12–31	19,000	2,990	6,370	240,000
April	12,500	3,080	5,020	299,000
May	10,400	4,070	5,410	333,000
June	26,500	4,310	10,800	643,000
July	4,830	97	1,930	119,000
August	136	4	14.9	916
September	3,280	3	1,600	95,200

Digitized by Google

PLATTE RIVER NEAR ASHLAND, NEBR.

LOCATION.—Chain gage in sec. 29, T. 13 N., R. 10 E., 3 miles northeast of Ashland. Zero of gage is 1,021.1 feet above mean sea level.
DRAINAGE AREA.—83,800 square miles.
RECORDS AVAILABLE.—August, 1928, to September, 1929.
EXTREMES.—Maximum discharge during year (estimated), 36,000 second-feet Mar. 13; minimum, 1,750 second-feet Aug. 12.
1928–29: Maximum and minimum discharge, same as given above.
REMARKS.—Records good except those for estimated periods, which are fair. Daily discharge not determined Jan. 1 to Feb. 28. Numerous diversions from headwaters. No regulation except on North Platte River.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,390	7,160	5,510				9,840	14,400	13,300	9,190	3,100	2,550
2	2,430	9,510	5,070				9,710	12,600	15,100	7,150	2,240	2,380
3	2,430	8,270	5,040			[a]5,300	9,130	11,900	14,200	6,560	2,020	2,220
4	2,390	7,530	4,850				8,750	10,800	13,900	5,990	1,950	2,200
5	2,330	6,520	4,720				8,820	9,970	14,600	7,150	1,900	2,260
6	2,330	6,850	4,560				8,880	9,520	11,900	10,200	1,900	2,180
7	2,410	9,340	4,240			[a]9,200	9,450	9,770	14,400	9,070	1,890	2,260
8	2,450	8,700					8,380	9,770	20,200	7,330	1,830	2,840
9	2,450	8,380					8,820	10,300	20,900	11,300	1,840	3,860
10	2,510	7,820				[b]13,100	8,190	10,900	21,300	9,260	1,810	5,000
11	2,600	8,070	[a]4,000			[a]20,000	9,320	12,200	21,200	7,760	1,790	5,220
12	4,800	7,870				[b]23,100	9,070	17,400	20,400	6,450	1,750	4,900
13	4,800	7,870				[a]36,000	7,940	14,600	18,400	5,880	1,800	4,160
14	4,740	7,720				28,500	7,880	12,900	16,300	6,040	1,850	3,570
15	4,720	7,250				22,100	7,150	12,600	15,100	10,800	2,220	3,210
16	5,100	7,070				19,300	7,510	11,200	14,200	13,000	2,000	4,620
17	5,860	7,160				15,800	7,760	10,600	14,400	9,450	1,920	5,600
18	7,160	7,250	[a]4,100		[b]3,500	13,900	8,190	11,800	15,000	7,760	1,880	6,040
19	5,930	7,340				12,400	9,390	10,000	27,600	6,100	1,860	6,100
20	5,380	7,210				11,400	11,200	8,940	21,800	5,880	1,900	5,990
21	5,260	7,120				10,600	10,800	9,070	17,900	6,740	1,930	6,100
22	4,800	7,070				9,390	11,100	8,190	17,600	4,710	1,930	5,650
23	4,610	6,940	[a]4,200			8,750	10,300	7,940	15,300	4,710	2,260	5,380
24	4,690	6,900				8,690	10,500	7,330	13,700	3,860	2,810	5,380
25	4,990	6,810				9,640	12,900	6,740	11,700	6,920	2,740	4,760
26	5,150	6,940				9,840	16,800	6,330	11,000	3,940	2,740	4,340
27	4,960	7,030				9,710	20,700	6,920	11,300	3,060	2,260	4,160
28	4,880	6,940	[a]4,000	[b]2,980		9,390	17,000	8,000	14,400	2,450	2,380	4,380
29	4,720	6,690				9,190	18,100	8,890	11,500	2,050	2,420	4,810
30	4,900	6,810				9,510	16,100	9,640	10,100	2,400	2,650	5,930
31	5,450	------				9,320	------	15,900	------	2,300	2,680	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	7,160	2,330	4,180	257,000
November	9,510	6,520	7,470	444,000
December	------	------	4,240	261,000
January	------	------	[a] 3,500	215,000
February	------	------	[a] 3,400	189,000
March	36,000	------	12,400	762,000
April	20,700	7,150	10,700	637,000
May	17,400	6,330	10,600	652,000
June	27,600	10,100	16,000	952,000
July	13,000	2,050	6,630	408,000
August	3,100	1,750	2,140	132,000
September	6,100	2,180	4,270	254,000
The year	36,000	------	7,120	5,160,000

[a] Estimated.
[b] Result of discharge measurement.

Digitized by Google

ROARING FORK NEAR WALDEN, COLO.

LOCATION.—Water-stage recorder in sec. 10, T. 8 N., R. 81 W., 1½ miles above mouth and 11 miles southwest of Walden.

DRAINAGE AREA.—84 square miles.

RECORDS AVAILABLE.—May, 1904, to October, 1905; October, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, 539 second-feet July 1 (gage height, 3.22 feet); minimum probably occurred during winter.

1904–5, 1923–1929: Maximum discharge, 790 second-feet June 15, 1924 (gage height, 3.73 feet); minimum, 2 second-feet Aug. 15, 1904.

REMARKS.—Records good. Daily discharge not determined Nov. 2–13, 17–21, and 25–30. Observations discontinued Dec. 1 to Apr. 24. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	22	20	-------	68	60	493	113	56
2	22	-------	-------	70	132	433	110	53
3	21	-------	-------	74	144	370	107	59
4	20	-------	-------	72	154	348	105	83
5	21	-------	-------	78	173	325	105	88
6	22	-------	-------	76	224	270	132	107
7	22	-------	-------	99	247	222	134	104
8	22	-------	-------	107	320	191	120	117
9	22	-------	-------	122	330	185	110	105
10	19	-------	-------	129	394	144	107	99
11	20	-------	-------	99	383	137	92	89
12	18	-------	-------	96	325	136	76	88
13	20	-------	-------	120	312	130	75	74
14	21	21	-------	142	304	141	64	74
15	22	20	-------	168	380	134	63	72
16	24	19	-------	171	307	132	64	*70
17	26	-------	-------	161	442	137	78	*66
18	24	-------	-------	180	338	156	96	*62
19	22	-------	-------	170	187	137	86	*58
20	23	-------	-------	163	176	124	83	54
21	25	-------	-------	136	222	132	78	*60
22	25	20	-------	134	333	142	81	*65
23	23	20	-------	144	417	134	76	*70
24	22	20	-------	166	414	146	70	*75
25	21	-------	86	198	383	134	68	*80
26	25	-------	64	243	417	127	60	*70
27	25	-------	68	185	490	120	56	63
28	25	-------	80	152	487	113	56	62
29	29	-------	117	120	474	122	53	62
30	22	-------	83	78	468	107	54	63
31	22	-------	-------	60	-------	105	59	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	29	18	22.5	1,380
November	-------	-------	*20	1,190
April 25–30	117	64	83	988
May	243	60	128	7,870
June	490	60	315	18,700
July	493	105	185	11,400
August	134	53	84.9	5,220
September	117	53	74.9	4,460

*Estimated.

Digitized by Google

MICHIGAN RIVER[1] AT WALDEN, COLO.

LOCATION.—Water-stage recorder in sec. 21, T. 9 N., R. 79 W., half a mile north of Walden. Zero of gage is 8,044.87 feet above mean sea level.

DRAINAGE AREA.—185 square miles.

RECORDS AVAILABLE.—May, 1904, to October, 1905; May, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, 746 second-feet May 15 (gage height, 3.08 feet); minimum probably occurred during winter.

1904–5, 1923–1929: Maximum discharge, 1,070 second-feet June 10, 1923 (gage height, 3.3 feet); minimum, 4 second-feet Aug. 28–31, 1924.

REMARKS.—Records good. Observations discontinued Nov. 14 to Apr. 21. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	17	27	.....	*120	381	410	*118	33
2	19	26	.....	93	415	358	*116	32
3	20	26	.....	93	537	310	*110	38
4	25	26	.....	88	537	278	105	61
5	25	27	.....	86	520	255	105	88
6	26	29	.....	90	503	232	120	107
7	24	30	.....	155	514	197	141	112
8	22	34	.....	344	492	172	122	*128
9	20	23	.....	420	543	135	102	138
10	20	24	.....	471	597	105	88	130
11	20	28	.....	362	629	84	79	122
12	19	26	.....	232	597	73	70	115
13	18	28	.....	327	566	73	61	100
14	20	.....	.....	455	526	110	55	93
15	23	.....	.....	572	503	110	50	93
16	26	.....	.....	591	498	107	47	93
17	26	.....	.....	498	459	98	*46	95
18	29	.....	.....	405	532	98	55	88
19	34	.....	.....	336	420	110	48	81
20	33	.....	.....	323	410	105	44	79
21	31	.....	.....	319	420	81	47	75
22	34	.....	178	323	514	79	50	75
23	26	.....	141	344	543	79	44	77
24	24	.....	133	386	543	86	42	84
25	26	.....	128	395	498	98	44	88
26	31	.....	125	430	455	88	44	84
27	30	.....	144	532	455	81	41	79
28	29	.....	172	526	471	73	37	79
29	30	.....	282	503	435	77	40	79
30	30	.....	*180	405	435	86	38	*79
31	28	.....	.....	390	.....	115	34	.....

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	34	17	25.3	1,560
November 1-13	34	23	27.2	701
April 22-30	282	125	165	2,940
May	591	86	342	21,000
June	629	381	501	29,800
July	410	73	141	8,670
August	141	34	69.1	4,250
September	138	32	87.5	5,210

* Estimated.

[1] Formerly published as Michigan Creek at Walden.

Digitized by Google

ILLINOIS CREEK AT WALDEN, COLO.

LOCATION.—Staff gage in sec. 29, T. 9 N., R. 79 W., half a mile southwest of Walden.

DRAINAGE AREA.—254 square miles.

RECORDS AVAILABLE.—May, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, 1,650 second-feet Apr. 18 (gage height, 5.0 feet); minimum, 3 second-feet Oct. 2 and 3.

1923–1929: Maximum discharge, 2,520 second-feet May 28, 1926 (gage height, 6.4 feet); minimum, 0.3 second-foot Sept. 7 and 8, 1924 (gage height, 0.42 foot).

REMARKS.—Records good. Observations discontinued Nov. 11 to Apr. 15. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	3	23	-------	240	217	168	53	24
2	3	21	-------	171	237	162	58	24
3	4	21	-------	159	339	124	60	24
4	5	16	-------	124	366	102	54	36
5	9	18	-------	111	382	93	47	43
6	9	18	-------	117	410	95	69	46
7	10	20	-------	196	394	89	97	54
8	9	20	-------	346	410	69	95	74
9	8	18	-------	320	386	56	65	109
10	8	16	-------	378	382	48	48	127
11	7	-------	-------	298	402	38	40	134
12	7	-------	-------	153	439	34	37	129
13	5	-------	-------	147	468	31	34	84
14	4	-------	-------	177	423	29	34	70
15	5	-------	-------	246	339	28	24	65
16	9	-------	925	263	298	26	22	65
17	10	-------	950	284	280	26	21	60
18	13	-------	1,650	280	316	25	19	58
19	16	-------	1,050	250	402	28	31	48
20	16	-------	625	196	274	31	25	48
21	18	-------	513	196	205	32	31	40
22	18	-------	312	165	192	25	33	38
23	16	-------	257	153	186	31	36	40
24	16	-------	243	202	211	32	37	48
25	18	-------	147	237	217	25	32	56
26	18	-------	142	280	224	25	31	56
27	15	-------	150	410	180	26	29	52
28	16	-------	183	542	174	28	29	45
29	18	-------	331	578	156	28	28	40
30	21	-------	452	488	150	38	26	40
31	21	-------	-------	342	-------	40	25	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	21	3	11.5	707
November 1–10	23	16	19.1	379
April 15–30	1,650	142	529	15,700
May	578	111	260	16,000
June	468	150	302	18,000
July	168	25	52.7	3,240
August	97	19	41.2	2,530
September	134	24	59.2	3,520

Digitized by Google

CANADIAN RIVER AT COWDREY, COLO.

LOCATION.—Chain gage in sec. 6, T. 10 N., R. 79 W., half a mile northeast of Cowdrey. Government Creek enters a third of a mile downstream. Zero of gage is 7,870.73 feet above mean sea level.

DRAINAGE AREA.—201 square miles.

RECORDS AVAILABLE.—May, 1904, to October, 1905; May to September, 1929.

EXTREMES.—Maximum discharge during year, 434 second-feet June 12 (gage height, 4.6 feet); minimum, 25 second-feet Aug. 31 to Sept. 2 (gage height, 2.20 feet).

1904–5, 1929: Maximum discharge, 600 second-feet June 10, 1905; minimum, 2 second-feet Aug. 26, 1905.

REMARKS.—Records good. Discharge estimated July 22. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1		257	172	48	25	16		348	50	26	60
2		257	172	49	25	17		327	46	26	60
3		297	172	49	26	18		327	46	28	53
4		327	190	53	27	19		307	45	32	53
5		327	172	53	28	20		277	44	35	53
6		327	130	52	44	21		247	45	37	53
7		348	114	61	75	22		247	47	33	52
8		348	85	51	92	23	247	247	49	33	51
9		348	75	50	98	24	287	218	49	32	51
10		390	72	48	72	25	297	199	48	31	50
11		390	58	41	65	26	307	190	44	28	49
12		434	50	36	63	27	390	190	45	28	48
13		390	45	33	63	28	390	172	44	28	46
14		369	43	29	63	29	390	172	44	28	46
15		327	45	27	60	30	348	181	44	28	46
						31	267		44	25	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 23–31	390	247	325	5,800
June	434	172	293	17,400
July	190	43	75.1	4,620
August	61	25	37.4	2,300
September	98	25	53.2	3,170
The period				33,300

Digitized by Google

ENCAMPMENT RIVER AT ENCAMPMENT, WYO.

LOCATION.—Chain gage in sec. 6, T. 14 N., R. 83 W., at Encampment. Zero of gage is 7,141.53 feet above mean sea level.

DRAINAGE AREA.—219 square miles.

RECORDS AVAILABLE.—May to September, 1900; May, 1911, to August, 1924; May to September, 1929.

EXTREMES.—Maximum discharge during year, 3,740 second-feet June 17 (gage height, 8.1 feet); minimum, 26 second-feet Sept. 2 (gage height, 3.70 feet).

1900, 1911–1924, 1929: Maximum discharge, 4,680 second-feet May 29, 1900; minimum, 3 second-feet July 24, 1919.

REMARKS.—Records fair. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1	------	1,630	1,570	112	30	16	------	2,780	360	46	96
2	------	2,030	1,340	96	26	17	------	3,260	340	49	88
3	------	1,890	1,180	85	37	18	------	2,030	340	57	79
4	------	2,170	1,080	96	108	19	------	1,890	301	55	74
5	------	2,320	948	92	61	20	------	2,030	301	54	71
6	------	2,620	825	198	92	21	1,570	2,030	265	45	64
7	------	2,780	715	150	117	22	1,760	2,170	248	39	114
8	------	2,940	615	76	130	23	2,030	2,170	235	35	155
9	------	3,100	528	74	108	24	2,170	1,890	235	33	165
10	------	3,260	500	71	145	25	2,620	1,760	192	37	121
11	------	3,100	475	68	140	26	2,470	1,890	168	35	242
12	------	2,620	450	58	130	27	1,700	2,030	145	30	160
13	------	2,620	528	54	133	28	1,290	1,890	117	39	117
14	------	2,780	450	48	130	29	1,080	1,760	119	42	108
15	------	2,780	428	48	106	30	1,040	1,700	112	41	104
						31	1,180	------	112	36	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 21–31	2,620	1,040	1,720	37,500
June	3,260	1,630	2,330	139,000
July	1,570	112	491	30,200
August	198	30	64.5	3,970
September	242	26	108	6,430
The period	------	------	------	217,000

49758—32——13

Digitized by Google

PASS CREEK NEAR SARATOGA, WYO.

LOCATION.—Staff gage in sec. 29, T. 19 N., R. 82 W., 12 miles northeast of Saratoga.
DRAINAGE AREA.—119 square miles.
RECORDS AVAILABLE.—May to September, 1929.
EXTREMES.—Maximum discharge during period, 450 second-feet May 23 (gage height, 5.5 feet); minimum, 11 second-feet Aug. 28 to Sept. 1.
REMARKS.—Records good. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1		312	106	19	11	16		244	18	12	16
2		312	101	19	12	17		312	18	13	15
3		277	77	20	14	18		187	16	14	14
4		277	68	15	22	19		174	17	17	13
5		312	59	17	17	20	260	162	16	16	13
6		312	64	28	18	21	277	156	16	14	14
7		312	43	30	18	22	277	162	16	14	17
8		312	43	23	20	23	312	162	16	13	22
9		312	36	16	19	24	350	156	14	12	18
10		331	29	15	17	25	331	132	13	13	17
11		331	26	14	17	26	390	127	12	14	20
12		294	23	14	17	27	244	127	12	12	59
13		244	26	13	16	28	294	116	15	11	18
14		277	29	13	15	29	244	111	16	11	17
15		277	25	12	14	30	294	101	16	11	16
						31	294		17	11	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 20–31	390	244	297	7,070
June	331	101	231	13,700
July	106	12	33.4	1,990
August	30	11	15.4	947
September	59	11	17.9	1,070
The period				24,800

Digitized by Google

ROCK CREEK NEAR ROCK RIVER, WYO.

LOCATION.—Water-stage recorder in sec. 4, T. 20 N., R. 76 W., 1½ miles southeast of Rock River.

DRAINAGE AREA.—184 square miles.

RECORDS AVAILABLE.—May, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 1,040 second-feet June 11 (gage height, 4.38 feet); minimum, 3.3 second-feet Oct. 1 (gage height, 0.29 foot).

1928–29: Maximum discharge, 1,180 second-feet May 29 and 30, 1928 (gage height, 4.53 feet); minimum, 2.7 second-feet Sept. 30, 1928 (gage height, 0.26 foot).

REMARKS.—Records good except those for estimated periods, Nov. 21 to Apr. 20 and July 16–20, which are fair. Diversions for irrigation above station. Flow partly regulated by two reservoirs.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.3	8.0						125	197	342	12	7.6
2	3.8	10						112	261	318	10	8.0
3	3.8	11					30	118	318	245	9.5	9.5
4	4.9	12						126	370	205	8.5	14
5	5.2	10						108	432	178	10	15
6	5.2	9.5	9	11	10	13		92	520	166	19	23
7	5.2	10						87	600	123	25	26
8	5.2	18					25	104	660	98	23	34
9	4.9	14						109	765	85	16	36
10	5.2	12						120	900	81	14	28
11	5.2	9.5						109	945	69	16	25
12	5.2	9.0						102	878	57	15	20
13	5.6	8.5				11	50	106	640	65	12	15
14	6.3	9.0						115	600	70	12	13
15	15	9.5	10	11	11			126	720	56	11	12
16	13	9.0						122	832	52	12	16
17	14	9.5						126	855	47	13	14
18	19	9.0					100	133	720	42	9.0	11
19	18	9.5						137	720	38	11	10
20	12	10				14		134	342	35	12	9.5
21	9.0						143	146	415	31	12	9.5
22	8.5						148	162	580	27	10	9.5
23	6.3						126	186	640	24	9.0	9.5
24	6.3						120	233	540	24	9.5	10
25	5.6				12		120	245	485	19	9.5	8.0
26	6.0	9.0	11	9			101	330	432	19	7.6	16
27	6.0						122	342	520	19	6.8	16
28	5.6					16	205	370	540	14	6.0	17
29	6.0						188	415	450	13	22	14
30	6.6				------		169	229	385	12	12	13
31	7.5	------			------		------	190	------	12	8.5	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	19	3.3	7.53	463
November	18	------	9.90	589
December	------	------	10.0	615
January	------	------	10.3	633
February	------	------	10.9	605
March	------	------	13.6	836
April	205	------	82.2	4,890
May	415	87	166	10,200
June	945	197	575	34,200
July	342	12	83.4	5,130
August	25	6.0	12.4	762
September	36	7.6	15.6	928
The year	945	------	82.8	59,800

Digitized by Google

DEER CREEK AT GLENROCK, WYO.

LOCATION.—Staff gage in sec. 4, T. 33 N., R. 75 W., at Glenrock, a quarter of a mile above mouth.

DRAINAGE AREA.—216 square miles.

RECORDS AVAILABLE.—April, 1916, to September, 1924; May, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 1,650 second-feet May 15 (gage height, 5.84 feet); minimum, 0.2 second-foot July 16 to Aug. 9 and Aug. 11–27 (gage height, 1.49 feet).

1916–1924, 1928–29: Maximum discharge, 4,600 second-feet Apr. 15, 1924; creek dry during summers of 1919 and 1922.

REMARKS.—Records good. Discharge estimated Mar. 13. Observations discontinued Nov. 1 to Mar. 9. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.8	------	39	418	446	6.0	0.2	1.1
2	10.9	------	37	380	482	6.0	.2	1.1
3	10.9	------	47	436	397	11	.2	1.3
4	12.6	------	66	544	341	8.0	.2	4.0
5	12.6	------	142	526	284	8.0	.2	4.0
6	13.2	------	170	418	266	6.0	.2	6.0
7	14.3	------	122	446	249	2.1	.2	3.5
8	13.2	------	116	536	209	1.6	.2	2.6
9	13.2	------	113	648	179	1.1	.2	2.6
10	12.0	45	109	695	146	1.2	.3	2.6
11	11.5	49	105	644	125	1.0	.2	2.6
12	12.0	54	88	745	109	1.2	.2	8.0
13	14.3	60	88	930	113	1.2	.2	12
14	16.6	69	88	1,200	96	1.2	.2	12
15	18.9	77	92	1,470	73	.7	.2	12
16	20.0	80	107	1,140	60	.2	.2	12
17	22.4	75	190	1,180	45	.2	.2	12
18	22.4	48	314	1,120	36	.2	.2	12
19	20.0	39	364	1,030	27	.2	.2	12
20	15.4	37	299	957	17	.2	.2	12
21	22.4	40	295	952	14	.2	.2	10
22	22.4	40	284	825	12	.2	.2	9.0
23	24.7	41	337	725	10	.2	.2	9.0
24	22.4	40	284	648	8.0	.2	.2	9.0
25	22.4	41	170	695	6.0	.2	.2	12
26	22.4	40	181	864	3.7	.2	.2	15
27	23.5	40	228	695	1.8	.2	.2	17
28	22.4	40	380	508	.6	.2	15	16
29	22.4	41	472	690	1.6	.2	14	18
30	22.4	42	648	639	4.5	.2	6.0	17
31	22.4	42	------	468	------	.2	1.8	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	24.7	9.8	17.6	1,080
March 10–31	80	37	49.1	2,140
April	648	37	199	11,800
May	1,470	380	747	45,900
June	482	.6	125	7,440
July	11	.2	1.92	118
August	15	.2	1.36	84
September	18	1.1	8.91	530

Digitized by Google

BOXELDER CREEK NEAR CAREYHURST, WYO.

LOCATION.—Water-stage recorder in sec. 13, T. 33 N., R. 74 W., 2 miles upstream from Careyhurst. Prior to Oct. 5, 1928, a staff gage 30 feet upstream was used; both gages set to same datum.

DRAINAGE AREA.—202 square miles.

RECORDS AVAILABLE.—May to October, 1911; April, 1916, to September, 1924; May, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 994 second-feet May 15 (gage height, 5.46 feet); no flow July 23, 24, and July 26 to Aug. 4.

1911, 1916–1924, 1928–29: Maximum discharge, 2,050 second-feet May 22, 1922; no flow during periods in 1922 and 1929.

REMARKS.—Records good except those for estimated periods, Oct. 1–4, Apr. 1–6, and 9–13, which are fair. Observations discontinued Nov. 19 to Mar. 31. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	6.0	13.2	45	374	416	4.4	0	1.5
2	6.4	12.7	45	329	434	2.3	0	1.5
3	6.8	12.2	50	374	371	1.2	0	1.9
4	7.2	12.7	100	538	317	1.0	0	2.3
5	7.6	13.2	145	538	275	.8	.2	2.3
6	8.1	13.7	180	388	252	.9	.4	2.8
7	9.0	14.7	239	388	231	.9	.7	2.3
8	9.4	14.7	143	456	206	.9	.9	2.3
9	9.4	16.2	135	483	183	.8	1.1	2.3
10	9.9	18.4	125	506	166	.9	1.3	2.3
11	8.5	18.4	110	496	143	.8	1.5	2.3
12	8.1	18.4	85	498	128	.7	1.5	1.5
13	7.6	17.8	80	606	116	.9	1.4	1.9
14	8.1	18.4	74	762	90	.8	1.4	1.9
15	12.2	18.4	114	878	65	.6	1.4	2.3
16	16.2	18.4	168	754	51	.4	1.5	1.4
17	15.7	18.4	260	822	44	.4	1.9	1.0
18	14.7	18.4	364	774	33	.3	2.3	1.0
19	15.7	-------	350	738	21	.2	2.3	.8
20	16.7	-------	272	742	19	.3	2.3	.6
21	16.7	-------	234	754	16	.2	1.9	1.0
22	16.7	-------	247	718	12	.1	1.5	4.9
23	15.2	-------	252	670	12	0	1.5	5.7
24	14.2	-------	308	630	15	0	1.4	5.7
25	13.7	-------	284	686	11	.2	1.5	6.2
26	12.7	-------	211	830	7.8	0	1.5	7.3
27	12.2	-------	221	702	5.7	0	1.5	7.3
28	12.2	-------	255	546	5.7	0	1.4	7.8
29	12.2	-------	522	610	5.3	0	1.4	8.4
30	12.2	-------	658	483	4.9	0	1.5	7.8
31	12.2	-------	-------	406	-------	0	1.4	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	16.7	6.0	11.4	701
November 1–13	18.4	12.2	16.0	571
April	658	45	209	12,400
May	878	329	596	36,600
June	434	4.9	122	7,260
July	4.4	0	.645	39.7
August	2.3	0	1.25	76.9
September	8.4	.6	3.28	195

Digitized by Google

LA PRELE CREEK NEAR DOUGLAS, WYO.

LOCATION.—Water-stage recorder in sec. 6, T. 31 N., R. 73 W., 16 miles southwest of Douglas.

DRAINAGE AREA.—146 square miles.

RECORDS AVAILABLE.—August, 1919, to September, 1929.

EXTREMES.—Maximum discharge during year, 716 second-feet Apr. 29 (gage height, 9.05 feet); minimum, 3.9 second-feet Aug. 3–6 (gage height, 3.39 feet).

1919–1929: Maximum discharge, 1,220 second-feet May 11, 1920 (gage height, 11.4 feet); minimum, 0.4 second-foot Oct. 2, 1919 (gage height, 3.29 feet).

REMARKS.—Records fair. Daily discharge not determined Dec. 1 to Feb. 28. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29.

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.9	12	*17	30	318	276	6.7	4.3	5.0
2	6.9	11	*22	32	297	297	6.3	4.3	5.2
3	7.1	13	30	49	353	262	6.1	3.9	5.4
4	7.1	12	40	128	405	230	5.5	3.9	5.5
5	7.3	12	77	210	368	204	5.5	3.9	5.7
6	7.5	12	93	101	325	204	5.4	3.9	7.5
7	7.5	13	85	78	318	184	5.4	4.0	8.8
8	7.5	13	77	72	339	171	5.4	4.0	9.0
9	7.3	13	58	59	375	161	5.4	4.2	9.0
10	7.8	12	53	53	375	144	5.4	4.3	10
11	8.0	13	53	49	353	122	5.2	4.3	11
12	8.2	14	81	48	353	118	5.2	4.3	10
13	9.0	15	107	*64	405	91	5.7	4.3	8.5
14	9.5	16	68	79	486	70	5.5	4.4	7.8
15	11	14	*59	97	503	50	5.5	4.4	7.3
16	11	14	*55	140	452	46	6.3	4.4	7.1
17	11	14	*50	204	452	36	7.3	4.4	7.1
18	13	*14	*50	236	436	29	11	4.4	7.1
19	14	*14	*50	213	420	23	8.8	4.4	6.7
20	15	*14	*50	194	420	20	7.5	4.4	6.7
21	14	15	*49	*178	436	17	7.1	4.6	6.7
22	14	15	*48	162	412	14	7.1	4.6	6.7
23	13	15	48	184	405	11	6.9	4.6	6.5
24	13	15	44	115	405	11	6.9	4.4	6.3
25	12	14	38	159	436	9.8	6.7	4.2	6.7
26	12	13	37	184	486	9.2	5.9	4.0	8.8
27	12	13	35	216	398	6.5	5.2	4.0	10
28	*12	14	41	204	325	6.1	5.0	36	9.5
29	*12	14	50	486	339	5.7	4.9	7.8	9.2
30	12	*13	54	469	290	6.2	4.8	6.3	8.8
31	13	-------	39	-------	283	-------	4.4	4.9	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	15	6.9	10.4	640
November	16	11	13.5	803
December	-------	-------	*12	738
January	-------	-------	*10	615
February	-------	-------	*11	611
March	107	17	53.5	3,290
April	486	30	153	9,100
May	503	283	386	23,700
June	297	5.7	94.5	5,620
July	11	4.4	6.13	377
August	36	3.9	5.48	337
September	11	5.0	7.65	455
The year	503	3.9	64.0	46,300

* Estimated.

Digitized by Google

LA PRELE CREEK NEAR ORPHA, WYO.[1]

LOCATION.—Staff gage in sec. 16, T. 33 N., R. 72 W., 1 mile south of Orpha and three-quarters of a mile above mouth.

DRAINAGE AREA.—227 square miles.

RECORDS AVAILABLE.—April to August, 1916; April to September, 1918; April, 1923, to September, 1924; May, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 370 second-feet May 27 (gage height, 3.84 feet); minimum, 2.7 second-feet July 25 (gage height, 0.37 foot). 1916, 1918, 1923–24, 1928–29: Maximum discharge, 437 second-feet May 10, 1918; minimum, 1 second-foot during summer of 1919.

REMARKS.—Records good except those for estimated periods (Mar. 1–9 and Sept. 18–30), which are fair. Observations discontinued Nov. 1 to Feb. 28. Diversions for irrigation above station. Flow regulated by La Prele Reservoir.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	25	95	16	42	15	6.6	13
2	23	25	52	18	42	18	12	12
3	18	25	43	21	35	20	20	9.0
4	14	30	36	24	58	22	24	7.2
5	8.2	40	29	64	187	19	27	9.0
6	5.8	45	24	199	256	16	26	12
7	6.6	42	22	217	280	18	35	16
8	8.6	41	20	236	137	16	40	25
9	10	40	18	252	66	15	42	40
10	8.2	42	18	293	54	10	44	50
11	7.4	37	22	327	36	12	48	55
12	8.2	39	22	339	29	15	46	53
13	9.0	43	21	332	19	16	50	31
14	10	43	22	320	13	15	51	27
15	12	40	24	336	11	12	53	25
16	14	37	25	339	11	10	54	22
17	17	38	23	327	10	7.8	56	22
18	18	39	21	338	8.4	6.6	57	
19	13	34	19	341	7.8	5.6	60	
20	8.2	30	15	334	7.2	5.0	60	
21	7.4	27	16	332	7.5	4.0	57	
22	6.6	26	15	330	7.2	3.6	54	
23	7.0	24	14	336	8.7	3.2	54	
24	8.6	22	16	336	21	2.9	58	26
25	9.0	20	19	352	22	2.7	57	
26	7.4	26	21	364	24	2.9	48	
27	6.2	33	21	368	21	3.6	43	
28	6.6	42	21	358	19	3.4	39	
29	7.4	77	19	345	16	3.0	34	
30	7.4	130	18	349	13	2.8	18	
31	6.6	104	-------	77	-------	3.6	15	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	25	5.8	10.5	646
March	130	20	40.8	2,510
April	95	14	25	1,490
May	368	16	265	16,300
June	280	7.2	49	2,920
July	22	2.7	10	615
August	60	6.6	41.6	2,560
September	55	7.2	26.1	1,490

[1] Prior to 1928 published as La Prele Creek near Fetterman, Wyo.

Digitized by Google

WAGONHOUND CREEK NEAR LA BONTE, WYO.

LOCATION.—Staff gage in sec. 16, T. 31 N., R. 71 W., near mouth of creek, 3 miles east of La Bonte.

DRAINAGE AREA.—125 square miles.

RECORDS AVAILABLE.—April, 1916, to September, 1924; May to August, 1929.

EXTREMES.—Maximum discharge during year, 186 second-feet May 5 (gage height, 5.52 feet); minimum, 2.5 second-feet July 13–15 and 20 (gage height, 1.12 feet).

1916–1924, 1929: Maximum discharge, 907 second-feet May 11 and 12, 1920; no flow during summers of 1918, 1919, and 1922.

REMARKS.—Records good except those for May 1–4, which are estimated. Diversion for irrigation above station.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Day	May	June	July	Aug.
1	170	46	10.5	5.0	16	111	3.0	3.0	-------
2	165	38	10.2	5.0	17	105	2.8	3.0	-------
3	165	38	9.3	5.0	18	90	11.1	3.0	-------
4	170	30	8.2	5.0	19	85	10.5	3.0	-------
5	181	26	8.2	-------	20	75	9.3	2.5	-------
6	176	26	8.2	-------	21	66	10.5	8.2	-------
7	153	26	7.7	-------	22	60	12.4	7.7	-------
8	158	26	7.1	-------	23	51	13.6	7.7	-------
9	163	21	7.1	-------	24	36	14.2	7.7	-------
10	161	19	4.8	-------	25	30	13.6	6.5	-------
11	140	15	5.0	-------	26	47	14.2	5.0	-------
12	134	10.5	3.0	-------	27	47	13.6	5.3	-------
13	136	5.0	2.5	-------	28	73	12.4	5.5	-------
14	139	5.0	2.5	-------	29	80	11.8	5.0	-------
15	141	2.5	2.5	-------	30	70	11.1	5.0	-------
					31	54	-------	5.0	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May	181	30	111	6,820
June	46	2.8	16.6	988
July	10.5	2.5	5.81	357
August 1–4	5.0	5.0	5.00	40
The period	-------	-------	-------	8,200

Digitized by Google

LA BONTE CREEK NEAR LA BONTE, WYO.

LOCATION.—Staff gage in sec. 21, T. 31 N., R. 71 W., 1½ miles above mouth and 3 miles east of La Bonte.

DRAINAGE AREA.—302 square miles.

RECORDS AVAILABLE.—April, 1916, to September, 1924; May, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 1,100 second-feet Apr. 30 and May 15 (gage height, 3.70 feet); minimum, 3.0 second-feet Sept. 26.

1916–1924, 1928–29: Maximum discharge, 2,750 second-feet May 22 and 23, 1923 (gage height, 7.5 feet); no flow during summers of 1917 and 1918.

REMARKS.—Records good except those for estimated periods, Mar. 1–9 and 12–16, which are fair. Observations discontinued Nov. 1 to Feb. 28. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.8	20	66	728	428	13	4.3	4.7
2	7.8	20	74	650	388	11	4.3	4.7
3	8.2	20	106	630	333	8.2	4.7	5.1
4	8.2	20	172	750	278	7.8	4.3	5.1
5	7.8	20	224	711	244	8.2	4.3	5.1
6	8.2	25	179	566	234	8.2	3.9	5.9
7	8.7	30	146	595	206	8.2	3.9	7.8
8	9.2	35	100	676	201	8.2	3.7	7.4
9	9.2	40	121	690	174	8.2	3.5	7.4
10	9.6	44	123	744	152	7.4	3.5	6.3
11	10	33	99	700	133	7.4	3.2	6.2
12	10	33	104	766	133	7.4	3.2	5.5
13	11	33	110	766	117	7.0	3.5	5.5
14	11	30	141	950	88	7.0	3.5	4.7
15	14	33	155	1,030	79	7.4	3.7	4.3
16	14	33	192	870	72	7.4	3.9	4.3
17	13	33	250	865	67	6.6	3.9	4.3
18	13	34	410	804	55	6.6	3.9	4.1
19	12	41	365	744	37	6.6	4.1	3.9
20	12	39	349	675	36	7.0	4.3	3.7
21	18	36	365	660	30	6.6	4.7	3.5
22	18	35	341	620	30	6.6	4.7	3.5
23	16	39	345	575	28	5.9	5.1	3.5
24	16	31	374	560	25	5.1	5.5	3.5
25	16	33	378	520	22	4.3	5.1	3.2
26	17	34	401	680	20	3.9	5.5	3.0
27	16	36	550	620	18	3.7	5.1	3.5
28	16	41	660	464	17	3.9	5.5	3.5
29	16	88	950	799	16	3.7	5.5	5.9
30	15	123	1,050	560	16	3.7	5.1	8.2
31	16	74	-------	432	-------	3.9	5.1	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	18	7.8	12.4	762
March	123	20	38.3	2,360
April	1,050	66	297	17,700
May	1,030	432	693	42,600
June	428	16	123	7,320
July	13	3.7	6.77	416
August	5.5	3.2	4.34	267
September	8.2	3.0	4.91	292

Digitized by Google

HORSESHOE CREEK NEAR GLENDO, WYO.

LOCATION.—Staff gage in sec. 26, T. 29 N., R. 68 W., 4 miles southeast of Glendo. Datum of gage raised 0.30 foot Mar. 1, 1929.

DRAINAGE AREA.—203 square miles.

RECORDS AVAILABLE.—April, 1916, to September, 1919; April, 1921, to September, 1924; May, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, determined by slope-area method, about 1,210 second-feet June 2 (gage height, 6.8 feet); minimum, 0.2 second-foot Mar. 16 (gage height, 0.3 foot).

1916–1919, 1921–1924, 1928–29: Maximum discharge, that of June 2, 1929; no flow during summers of 1918 and 1919.

REMARKS.—Records good. Observations discontinued Nov. 11 to Feb. 28. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.0	8.0	2.2	30	385	256	6.0	2.2	2.0
2	4.0	8.0	2.2	38	363	850	3.1	2.0	1.6
3	3.8	8.0	2.2	38	382	275	5.8	1.7	1.7
4	3.8	8.0	2.2	77	360	269	3.5	2.2	1.7
5	4.0	9.7	4.0	166	390	232	3.5	2.1	2.0
6	3.8	9.7	7.6	99	351	248	3.1	2.1	2.0
7	3.8	9.7	6.2	77	322	215	2.9	2.1	2.0
8	3.8	9.7	6.2	54	332	196	2.7	2.2	1.7
9	3.8	9.7	4.0	54	341	156	2.4	2.2	1.8
10	3.8	9.7	6.2	41	341	140	2.2	2.1	1.8
11	3.8	-------	4.0	41	344	128	2.4	2.2	1.8
12	3.8	-------	4.0	41	334	128	2.4	2.0	1.8
13	3.8	-------	2.2	41	351	116	2.6	2.0	2.0
14	3.8	-------	2.2	72	390	105	2.2	2.1	2.1
15	4.0	-------	1.0	82	442	88	2.2	2.0	2.2
16	4.0	-------	.2	88	385	86	2.4	2.0	2.0
17	4.0	-------	6.2	105	370	70	2.2	2.0	2.2
18	4.0	-------	10	151	356	67	2.6	2.2	2.4
19	4.0	-------	6.2	158	304	62	2.4	2.0	2.4
20	4.0	-------	9.0	174	281	44	2.6	1.7	2.2
21	4.3	-------	6.2	199	248	30	2.6	1.7	2.2
22	4.0	-------	7.6	174	240	26	2.2	2.0	2.2
23	4.3	-------	9.0	221	232	23	2.2	2.0	2.2
24	4.8	-------	10	476	176	22	2.6	1.7	2.2
25	5.6	-------	9.0	244	199	16	2.2	1.8	2.2
26	6.2	-------	12	250	346	11	2.2	2.0	2.4
27	6.8	-------	12	304	286	10	2.2	1.7	2.4
28	7.4	-------	16	332	348	9.3	2.2	2.0	2.4
29	8.0	-------	16	432	422	6.8	2.2	1.8	2.2
30	8.0	-------	41	470	304	6.2	2.2	1.7	2.2
31	8.0	-------	30	-------	275	-------	2.2	2.0	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	8.0	3.8	4.68	288
November 1–10	9.7	8.0	9.02	179
March	41	.2	8.26	509
April	476	30	158	9,400
May	442	176	329	20,200
June	850	6.2	130	7,740
July	6	2.2	2.72	167
August	2.2	1.7	1.98	122
September	2.4	1.6	2.07	123

Digitized by Google

COTTONWOOD CREEK AT WENDOVER, WYO.

LOCATION.—Chain gage in sec. 15, T. 27 N., R. 67 W., at Wendover, half a mile above mouth of creek.

DRAINAGE AREA.—159 square miles.

RECORDS AVAILABLE.—April, 1916, to September, 1924; May to September, 1929.

EXTREMES.—Maximum discharge during year, determined by slope-area method, about 840 second-feet June 1 (gage height, 5.02 feet); minimum, 3.3 second-feet July 10 (gage height, 1.66 feet).

1916–1924,1929: Maximum discharge, that of June 1, 1929; minimum, 0.2 second-foot June 21 to Sept. 30, 1919.

Maximum stage known, 10.6 feet Aug. 15, 1927 (discharge, about 5,800 second-feet).

REMARKS.—Records good except those for estimated periods, which are fair. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1	125	282	*4.2	7.9		16	58	20	4.0	7.2	*5.0
2	122	274	4.0	*7.7		17	54	16	3.8	8.6	*5.0
3	112	117	4.0	7.6		18	58	9.3	4.5	171	*5.0
4	112	92	4.5	7.9		19	50	6.8	4.0	6.8	*4.5
5	118	92	4.5	7.2		20	42	7.2	3.8	6.5	4.5
6	120	106	4.0	7.9		21	32	6.0	*3.9	6.2	4.5
7	108	106	4.0	7.9		22	25	6.0	4.0	6.5	4.5
8	90	101	4.2	8.6	*5.5	23	20	*6.0	12	*6.0	4.5
9	90	82	3.6	*8.6		24	23	6.0	11	*5.5	*5.8
10	85	73	3.3	8.6		25	20	5.5	10	*5.0	7.2
11	81	55	4.2	9.3		26	24	4.8	8.6	*4.5	6.5
12	81	52	3.8	7.9		27	33	4.2	*9.0	4.0	*7.2
13	60	36	5.2	*7.9		28	36	4.0	9.3	6.5	7.9
14	63	33	5.8	*7.6		29	108	4.0	9.3	6.0	7.2
15	63	31	4.2	*7.2		30	102	4.5	9.3	6.0	7.2
						31	81	------	9.0	6.0	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May	125	20	71.1	4,370
June	282	4.0	54.7	3,250
July	12	3.3	5.77	355
August	171	4.0	12.3	756
September	7.9	4.5	5.63	335
The period	------	------	------	9,070

* Estimated.

Digitized by Google

LARAMIE RIVER NEAR GLENDEVEY, COLO.

LOCATION.—Water-stage recorder in sec. 25, T. 10 N., R. 76 W., 3 miles east of Glendevey. Gage moved 100 feet upstream on July 9, 1929.

DRAINAGE AREA.—101 square miles.

RECORDS AVAILABLE.—June, 1904, to October, 1905; August, 1910, to September, 1929.

EXTREMES.—Maximum discharge during year, 780 second-feet June 9 (gage height, 3.00 feet); minimum occurred during winter.

1904–5, 1910–1929: Maximum discharge, 2,240 second-feet June 9, 1923 (gage height, 4.55 feet, old datum); minimum, 5 second-feet Feb. 14 and 15, 1911.

REMARKS.—Records good except those for estimated periods, which are fair. Observations discontinued Dec. 1 to Apr. 27. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	20	26	--------	51	450	352	104	34
2	20	25	--------	42	560	293	93	34
3	18	20	--------	41	530	285	74	41
4	18	*20	--------	41	600	258	65	54
5	18	*20	--------	41	610	236	72	51
6	18	*22	--------	47	615	214	114	61
7	18	*22	--------	58	645	185	88	67
8	16	*22	--------	77	684	178	67	58
9	17	*22	--------	86	696	123	63	49
10	16	24	--------	82	*720	126	61	56
11	17	23	--------	80	*710	131	56	61
12	18	23	--------	77	*650	131	49	58
13	24	23	--------	95	*620	143	44	54
14	28	24	--------	107	*590	129	42	47
15	34	21	--------	127	*600	131	41	46
16	39	21	--------	146	*500	126	40	44
17	40	27	--------	157	*580	117	44	42
18	42		--------	173	*460	104	51	42
19	38		--------	168	365	96	46	41
20	37		--------	173	401	104	41	41
21	37		--------	236	430	91	40	46
22	32		--------	285	465	98	38	44
23	34		--------	406	455	104	35	41
24	34	*25	--------	455	415	98	38	41
25	33		--------	510	410	91	36	40
26	35		--------	480	445	86	30	38
27	32		--------	361	445	91	30	34
28	34		--------	323	430	79	32	35
29	36		40	251	415	76	21	35
30	30		55	229	365	104	32	31
31	34	--------	60	323	--------	104	34	--------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	42	16	28.0	1,720
November	27	20	23.7	1,410
May	510	41	185	11,400
June	720	365	539	31,800
July	352	76	145	8,920
August	114	30	52.6	3,230
September	67	31	45.5	2,710

* Estimated.

Digitized by Google

LARAMIE RIVER NEAR JELM, WYO.

LOCATION.—Water-stage recorder in sec. 15, T. 12 N., R. 77 W., one-fourth mile north of Colorado-Wyoming line and 4 miles south of old Jelm. Zero of gage is 7,685.32 feet above mean sea level.

DRAINAGE AREA.—297 square miles.

RECORDS AVAILABLE.—June, 1904, to October, 1905; May, 1911, to September, 1929.

EXTREMES.—Maximum discharge during year, 1,960 second-feet June 10 (gage height, 3.46 feet); minimum occurred during winter.

1904–5, 1911–1929: Maximum discharge, 4,200 second-feet June 9, 1923 (gage height, 4.15 feet); minimum, 22 second-feet Sept. 22-24, Oct. 4–8, 18–23, and 28–31, 1905.

REMARKS.—Records good except those for Oct. 9–11, Nov. 3–11, and 18–30, which are estimated. Observations discontinued Dec. 1 to Apr. 22. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	45	51	-------	144	995	892	242	52
2	45	54	-------	121	1,280	728	216	52
3	44	50	-------	126	1,270	639	176	57
4	44	50	-------	126	1,320	591	163	87
5	49	50	-------	116	1,390	546	173	92
6	54	50	-------	110	1,480	504	213	144
7	54	50	-------	132	1,480	404	227	157
8	54	50	-------	166	1,620	388	163	157
9	52	50	-------	206	1,720	350	141	152
10	50	50	-------	220	1,780	310	132	129
11	45	50	-------	166	1,760	294	126	135
12	43	52	-------	138	1,590	294	110	124
13	46	54	-------	182	1,450	298	92	148
14	49	51	-------	250	1,410	289	84	135
15	63	54	-------	310	1,500	306	75	121
16	63	58	-------	306	1,270	319	70	107
17	58	58	-------	324	1,450	277	82	102
18	78	50	-------	350	1,170	306	90	90
19	71	45	-------	341	963	246	84	80
20	75	40	-------	364	995	250	78	77
21	75	40	-------	471	1,020	227	68	77
22	64	45	-------	576	1,130	202	68	77
23	55	50	121	757	1,180	220	64	84
24	55	52	116	912	1,010	261	59	107
25	56	55	100	1,100	974	206	70	77
26	63	52	94	1,140	963	186	62	70
27	66	50	97	882	962	189	57	62
28	63	50	110	933	953	186	66	59
29	68	45	166	757	923	163	68	57
30	63	35	186	639	852	199	62	64
31	61	-------	-------	814	-------	235	57	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	75	43	57.0	3,500
November	58	35	49.7	2,960
April 23-30	186	94	124	1,970
May	1,140	110	425	26,100
June	1,780	852	1,260	75,000
July	892	163	339	20,800
August	242	57	111	6,820
September	157	52	97.1	5,780

Digitized by Google

LARAMIE RIVER AT FORT LARAMIE, WYO.

LOCATION.—Staff gage in sec. 25, T. 26 N., R. 65 W., at siphon crossing of Fort Laramie Canal, 3 miles west of Fort Laramie.
DRAINAGE AREA.—4,580 square miles.
RECORDS AVAILABLE.—April, 1915, to September, 1929.
REMARKS.—Diversions for irrigation above station. Flow regulated by Wheatland Reservoir. Complete records furnished by United States Bureau of Reclamation.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	92	178	159	165	105	135	250	1,350	2,300	335	92	120
2	92	177	180	138	125	135	250	1,200	2,500	195	92	150
3	84	188	115	145	135	135	230	1,110	2,100	195	78	130
4	84	170	105	155	135	165	220	1,250	2,000	145	78	130
5	76	186	105	126	145	165	245	1,350	2,000	145	145	130
6	76	199	115	126	145	190	590	1,400	1,900	112	92	170
7	113	215	115	126	105	230	840	1,350	1,800	112	78	260
8	113	196	128	151	105	225	590	1,200	1,700	335	78	412
9	92	192	141	178	105	230	565	1,350	1,450	145	78	490
10	106	208	141	155	110	230	540	1,400	1,400	112	78	335
11	100	179	141	155	105	240	425	1,400	1,150	112	78	320
12	110	167	141	151	115	240	465	1,400	1,200	92	112	320
13	120	169	151	165	115	240	425	1,450	1,450	92	92	320
14	125	165	151	165	115	190	445	1,500	955	92	78	280
15	145	169	147	155	115	240	395	1,600	840	412	67	280
16	150	173	148	165	115	240	480	1,700	800	145	67	280
17	150	169	122	165	115	222	935	1,750	722	412	67	280
18	167	149	112	158	115	226	960	1,750	567	260	67	200
19	150	145	106	138	115	231	1,020	1,800	490	335	67	200
20	148	145	85	102	120	231	935	1,780	450	195	78	200
21	142	135	100	102	120	231	905	1,500	375	145	67	200
22	142	159	115	114	115	231	765	1,400	335	260	90	200
23	142	145	122	95	115	238	710	1,200	335	145	90	200
24	140	149	128	95	115	238	710	1,150	412	112	90	200
25	140	149	128	95	115	238	1,050	1,110	260	567	90	200
26	145	141	128	110	115	224	722	1,110	260	260	150	200
27	145	155	140	110	140	211	727	1,500	195	145	100	200
28	142	169	147	110	140	211	805	1,780	145	112	100	320
29	142	167	160	110	------	227	960	1,800	112	260	150	280
30	145	167	150	110	------	221	1,110	2,000	145	112	100	280
31	148	------	165	110	------	266	------	2,000	------	112	100	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	167	76	125	7,690
November	215	135	169	10,100
December	180	85	132	8,120
January	178	95	134	8,240
February	145	105	119	6,610
March	266	135	215	13,200
April	1,110	220	642	38,200
May	2,000	1,110	1,470	90,400
June	2,500	112	1,010	60,100
July	567	92	200	12,300
August	150	67	90.0	5,530
September	490	120	243	14,500
The year	2,500	67	380	275,000

Digitized by Google

RAWHIDE CREEK NEAR LINGLE, WYO.

LOCATION.—Staff gage in sec. 17, T. 25 N., R. 62 W., 1 mile east of Lingle and 2 miles above mouth.

DRAINAGE AREA.—510 square miles.

RECORDS AVAILABLE.—May, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 340 second-feet June 2 (gage height, 5.5 feet); minimum probably occurred during winter.

1928–29: Maximum and minimum discharge, same as given above.

REMARKS.—Records good except those for estimated periods, Apr. 1–5, 7–15, and July 4, which are fair. Observations discontinued Nov. 10 to Mar. 31. No diversions. Low-water flow represents return seepage from Interstate Canal.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	50	40	20	31	30	22	36	49
2	118	45	20	29	266	18	47	71
3	85	39	22	32	56	14	56	63
4	50	39	26	33	37	16	42	64
5	52	38	30	39	31	16	74	89
6	54	36	32	42	31	21	70	83
7	65	39	34	42	30	24	78	113
8	53	42	34	56	29	24	74	126
9	68	40	35	50	28	27	34	119
10	65	------	35	46	26	28	58	119
11	56	------	36	34	24	32	61	98
12	65	------	34	45	30	31	57	92
13	37	------	30	45	31	30	61	88
14	39	------	26	43	32	39	66	85
15	51	------	22	38	30	33	58	66
16	52	------	21	30	28	71	54	42
17	48	------	21	30	28	59	46	65
18	44	------	23	32	24	36	43	36
19	40	------	36	28	20	21	76	37
20	44	------	60	27	24	41	93	35
21	40	------	58	28	38	35	99	32
22	40	------	48	26	20	33	81	26
23	46	------	36	25	23	59	36	34
24	85	------	54	24	21	46	32	36
25	66	------	45	23	21	42	36	34
26	56	------	50	23	18	36	38	36
27	54	------	45	23	19	27	58	39
28	56	------	34	24	24	34	52	32
29	50	------	32	28	23	40	54	67
30	46	------	32	27	19	31	52	44
31	41	------	------	28	------	43	45	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	118	37	55.4	3,410
November 1–9	45	36	39.8	710
April	60	20	34.4	2,050
May	56	23	33.3	2,050
June	266	19	35.4	2,110
July	71	14	33.2	2,040
August	99	32	57.0	3,500
September	126	26	64.0	3,810

Digitized by Google

KATZER DRAIN NEAR HENRY, NEBR.

LOCATION.—Staff gage in sec. 12, T. 23 N., R. 60 W., 3 miles southwest of Henry.
RECORDS AVAILABLE.—June, 1928, to September, 1929.
EXTREMES.—Maximum discharge during year, about 1,050 second-feet June 2 (gage height, 9.9 feet).
1928–29: Maximum discharge, that of June 2, 1929.
REMARKS.—Records poor. Discharge estimated Mar. 13–18. Observations discontinued Nov. 1 to Mar. 9, except for occasional readings in November and December. Katzer Drain enters North Platte River in Wyoming, 1 mile above Nebraska line. Flow is return water from area under Fort Laramie Canal.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20				6	10	18	26	27	41
2	8.6				4	7	412	25	28	37
3	4.9				4	7	19	22	30	47
4	4.9				4	10	10	23	31	46
5	4.7				4	13	10	24	34	47
6	4.7		4		4	11	9	26	29	72
7	4.7				4	10	7	26	29	58
8	4.7				6	10	6	27	29	58
9	4.7				6	9	7	24	28	33
10	4.7			1	7	10	7	21	29	26
11	4.7			1	8	9	7	15	30	27
12	4.7			5	6	10	6	13	34	27
13	4.7			1	6	9	6	25	35	19
14	4.7			1	6	10	8	30	35	16
15	7.8			1	6	9	7	28	30	16
16	4.7	11		1	5	10	7	26	30	16
17	4.7			2	5	10	7	25	30	17
18	4.7			4	6	12	8	25	32	17
19	4.7			9	24	11	7	25	33	17
20	4.7			10	49	11	7	24	33	17
21	4.7			11	20	28	7	26	33	17
22	4.7			10	47	25	7	27	33	18
23	4.7			4	41	30	7	25	38	21
24	4.7			4	81	20	8	25	33	19
25	4.7			6	15	16	12	27	33	13
26	4.7			6	13	16	18	27	36	13
27	4.7	5		4	10	15	27	27	37	15
28	4.7			4	10	15	27	30	36	17
29	4.7			6	9	16	24	32	36	21
30	4.7			6	9	21	27	28	39	17
31	5.6			5		19		26	42	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	20	4.7	5.45	335
March 10–31	11	1	4.64	202
April	81	4	14.2	845
May	30	7	13.5	830
June	412	6	24.6	1,460
July	32	13	25.2	1,550
August	42	27	32.6	2,000
September	72	13	27.5	1,640

Digitized by Google

HORSE CREEK NEAR YODER, WYO.

LOCATION.—Water-stage recorder in sec. 13, T. 22 N., R. 62 W., 6 miles southeast of Yoder. Prior to Nov. 11, 1928, a staff gage 300 feet downstream was used.

DRAINAGE AREA.—1,320 square miles.

RECORDS AVAILABLE.—May, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 455 second-feet June 8 (gage height, 4.59 feet); no flow several days during July, August, and September. 1928–29: Maximum and minimum discharge, same as given above.

REMARKS.—Records good except those for estimated periods, which are fair. Diversions for irrigation above station. Flow regulated by Hawk Springs Reservoir.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.5		55				96	212	36	12	0	0
2	7.2		49				58	223	179	10	.9	0
3	7.9		71				43	224	92	12	3.5	0
4	14		74				35	214	168	12	.4	1.5
5	32		58				48	208	293	6.5	0	2.5
6	22	a 1.0	56	a 17	a 14	a 20	75	182	255	4.0	.4	17
7	26		54				71	169	226	3.5	.5	35
8	9.7		55				69	165	339	3.0	.8	44
9	5.9		54				79	159	381	1.5	.6	50
10	5.9		53				97	152	268	1.5	.6	54
11	6.9	1.0	52				99	138	183	1.5	.1	56
12	5.4	6.0	54				97	127	145	4.0	.2	49
13	2.8	20	49				93	124	122	3.5	.1	44
14	2.8	34	47				91	119	105	3.5	.1	42
15	3.5	51	45			a 30	87	111	90	2.5	.1	41
16	4.0	57	40	a 16	a 14		79	106	74	7.0	.2	a 39
17	2.5	74	38				71	101	61	6.0	.2	a 37
18	1.8	108	32				64	100	52	4.0	.2	a 36
19	2.0	100	35			a 30	70	98	44	3.5	1.0	a 35
20	1.7	90	38			a 30	111	94	38	3.5	1.0	a 34
21	2.0	85	47			a 40	127	89	28	2.0	.8	a 33
22	4.2	78	59			a 60	123	87	23	4.0	.3	32
23	1.8	67	55			a 80	111	63	22	3.0	.2	33
24	1.3	72	61			85	151	44	24	2.0	.1	33
25	1.2	93	59		a 17	77	212	39	24	.9	.1	35
26	1.0	137	58	a 15		74	223	38	16	.6	0	a 36
27	1.0	137	52			63	183	35	14	.3	0	a 36
28	1.0	146	59			52	174	35	13	.3	0	a 37
29	1.0	152	54			53	196	35	12	.1	0	37
30	1.0	133	47		-------	75	217	33	12	0	0	27
31	1.2	-------	41		-------	111	-------	33	-------	0	0	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	32	1.0	5.97	367
November	152	1.0	55.0	3,270
December	74	32	51.6	3,170
January	-------	-------	16	984
February	-------	-------	15	833
March	111	-------	41.0	2,520
April	223	35	108	6,430
May	224	33	115	7,070
June	381	12	111	6,600
July	12	0	3.81	234
August	3.5	0	.40	25
September	56	0	31.9	1,900
The year	381	0	46.2	33,400

a Estimated.

Digitized by Google

SOUTH PLATTE RIVER AT SOUTH PLATTE, COLO.

LOCATION.—Water-stage recorder in sec. 25, T. 7 S., R. 70 W., 375 feet below mouth of North Fork of South Platte River at South Platte. Zero of gage is 6,078.43 feet above mean sea level.

DRAINAGE AREA.—2,550 square miles.

RECORDS AVAILABLE.—March, 1902, to September, 1929.

EXTREMES.—Maximum discharge during year, 2,340 second-feet Aug. 9 (gage height, 4.84 feet); minimum occurred during winter.

1902–1929: Maximum discharge, 6,320 second-feet June 7, 1921 (gage height, 8.95 feet); minimum, 21 second-feet Aug. 4, 1902.

REMARKS.—Daily discharge not determined Dec. 1 to Mar. 31; estimated Apr. 1–17. Diversions for irrigation above station. Flow regulated by Cheesman Reservoir. Complete records furnished by State engineer.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	222	162	159	155	424	402	755	892
2	238	164	155	142	460	456	1,170	850
3	219	132	171	147	409	448	1,690	836
4	190	153	185	151	428	440	1,520	704
5	192	164	194	160	503	424	1,810	716
6	188	192	179	190	440	428	1,660	782
7	213	210	158	202	418	421	1,640	928
8	233	192	146	213	432	405	1,980	1,040
9	230	113	122	236	436	405	2,220	1,100
10	210	104	112	264	413	421	1,850	985
11	197	108	85	274	390	424	1,530	878
12	202	106	155	250	417	394	1,250	822
13	210	108	132	236	398	369	1,060	632
14	219	104	130	284	413	405	907	620
15	238	216	118	331	452	468	822	609
16	255	130	131	405	362	508	762	577
17	253	76	133	331	348	526	762	556
18	192	71	155	341	376	609	775	541
19	192	59	162	327	405	666	788	526
20	185	58	171	338	324	609	762	541
21	183	68	140	383	503	551	710	546
22	180	88	126	381	795	432	704	577
23	210	95	123	387	808	815	736	643
24	197	94	123	460	755	1,140	775	541
25	192	92	123	448	822	729	843	494
26	147	83	119	481	729	691	843	481
27	149	71	123	424	775	678	749	481
28	149	82	130	405	782	742	1,060	531
29	173	54	140	436	536	950	1,240	526
30	208	48	151	369	440	878	1,120	498
31	149	-------	-------	402	-------	775	936	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	255	147	200	12,300
November	216	48	113	6,720
December	-------	-------	*78	4,800
January	-------	-------	*94	5,780
February	-------	-------	*93	5,160
March	-------	-------	*108	6,640
April	194	85	142	8,450
May	481	142	308	18,900
June	822	324	506	30,100
July	1,140	369	568	34,900
August	2,220	704	1,140	70,100
September	1,100	481	682	40,600
The year	2,220	-------	338	244,000

* Estimated.

Digitized by Google

NORTH FORK OF SOUTH PLATTE RIVER AT SOUTH PLATTE, COLO.

LOCATION.—Water-stage recorder in sec. 25, T. 7 S., R. 70 W., one-third mile above South Platte. Zero of gage is 6,090.55 feet above mean sea level.

DRAINAGE AREA.—484 square miles.

RECORDS AVAILABLE.—June, 1909, to September, 1910; April, 1913, to September, 1929.

EXTREMES.—Maximum discharge during year, 857 second-feet Aug. 7 (gage height, 4.04 feet); minimum occurred during winter.

1909–10, 1913–1929: Maximum discharge, 1,910 second-feet June 8, 1921 (gage height, 5.9 feet); minimum, 12 second-feet Dec. 18, 1922 (gage height, 1.5 feet).

REMARKS.—Discharge estimated Nov. 17–23, 28–30, and Apr. 1–10. Observations discontinued Dec. 1 to Mar. 31. Diversions for irrigation above station. Complete records furnished by State engineer.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	44	49	58	90	271	146	274	258
2	40	31	58	74	324	150	284	239
3	38	33	58	79	301	142	612	290
4	31	45	58	82	264	144	488	255
5	39	47	58	90	258	137	621	248
6	40	50	42	95	255	131	760	293
7	44	52	42	99	242	124	746	321
8	45	48	42	108	256	131	612	363
9	43	44	42	121	258	164	583	345
10	43	42	42	135	242	158	512	311
11	47	46	44	131	218	156	440	299
12	42	44	59	112	207	154	375	287
13	44	45	65	121	189	148	364	264
14	45	45	64	152	177	154	345	258
15	52	40	67	182	191	171	335	264
16	57	40	74	207	175	137	298	258
17	57	38	79	191	171	133	314	239
18	53	36	87	218	158	144	324	224
19	57	36	90	186	150	150	277	221
20	56	34	87	196	144	164	274	215
21	52	34	79	233	139	160	283	209
22	51	32	74	204	139	154	258	202
23	47	32	72	221	139	268	264	199
24	47	30	76	268	137	298	331	194
25	48	40	76	274	148	199	364	182
26	50	48	75	318	150	158	335	177
27	49	40	72	248	150	135	293	166
28	48	40	65	207	150	194	352	164
29	49	40	72	184	148	182	335	162
30	48	40	87	172	148	173	304	160
31	48	-------	-------	212	-------	233	268	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	57	31	46.9	2,880
November	52	30	40.7	2,420
April	90	42	65.5	3,900
May	318	74	168	10,300
June	324	137	197	11,700
July	298	124	164	10,100
August	760	258	394	24,200
September	363	160	242	14,400

Digitized by Google

WEST FORK OF CLEAR CREEK NEAR EMPIRE, COLO.

LOCATION.—Water-stage recorder in sec. 27, T. 3 S., R. 74 W., 75 feet below Miller Creek and 1 mile east of Empire. Zero of gage is 8,271.27 feet above mean sea level.

DRAINAGE AREA.—57 square miles.

RECORDS AVAILABLE.—June to September, 1929.

EXTREMES.—Maximum discharge during period, 373 second-feet June 10 (gage height, 2.13 feet); minimum, 50 second-feet Sept. 30 (gage height, 0.90 foot).

REMARKS.—Records fair. Discharge estimated June 1–3 and 5. Possibly a few diversions for mining purposes.

Daily and monthly discharge, in second-feet, 1929

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.
1	160	219	172	68	16	261	123	101	62
2	180	206	152	69	17	273	127	103	60
3	190	193	152	71	18	258	140	98	56
4	193	182	145	69	19	261	134	88	54
5	255	160	148	70	20	269	134	85	54
6	269	145	186	72	21	265	130	85	53
7	281	136	186	74	22	273	132	79	53
8	309	132	168	75	23	273	145	75	52
9	321	119	160	71	24	269	148	74	52
10	329	112	152	70	25	265	138	72	52
11	321	108	138	71	26	261	136	71	53
12	285	105	127	69	27	246	172	71	53
13	238	106	117	67	28	242	215	77	52
14	242	115	112	64	29	238	179	77	52
15	265	119	106	63	30	227	176	75	51
					31		160	69	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
June	329	160	257	15,300
July	219	105	147	9,040
August	186	69	114	7,010
September	75	51	61.7	3,670
The period				35,020

Digitized by Google

CLEAR CREEK NEAR GOLDEN, COLO.

LOCATION.—Water-stage recorder in sec. 32, T. 3 S., R. 70 W., in canyon 1½ miles above Golden.

DRAINAGE AREA.—392 square miles.

RECORDS AVAILABLE.—December, 1908 to December, 1909; June, 1911, to September, 1929.

EXTREMES.—Maximum discharge during year, 1,280 second-feet Aug. 5 (gage height, 4.42 feet); minimum occurred during winter.

1908–9, 1911–1929: Maximum discharge, 4,420 second-feet July 31, 1921; minimum, 18 second-feet Jan. 11, 1918.

REMARKS.—Discharge estimated Oct. 31, Nov. 1–8, and 11. Daily discharge not determined Nov. 12 to Apr. 26. Golden ditch diverts above station. Complete records furnished by State engineer.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	71	46			*34		19	512	559	559	314
2	66	36					41	595	525	498	310
3	80	79		*53			38	624	492	552	319
4	114	87					56	624	486	532	324
5	119	52					50	646	453	588	286
6	66	66	*31				34	661	411	722	305
7	61	66					67	653	371	706	276
8	110	80					94	691	393	661	319
9	80	56				*50	154	761	350	588	334
10	80	70					125	769	319	573	295
11	80	90					114	676	310	559	286
12	121						130	616	314	525	286
13	63						116	580	310	466	241
14	53						119	653	276	447	232
15	114						202	776	479	405	232
16	123						236	588	428	393	254
17	80						267	638	405	371	228
18	70						245	609	393	434	220
19	110						254	588	366	382	232
20	76						295	595	393	382	232
21	58						319	623	405	329	232
22	87						290	631	486	340	217
23	80						360	631	539	310	217
24	66						399	646	653	305	213
25	66						466	616	539	319	202
26	87						580	595	472	314	202
27	52					30	518	602	405	295	191
28	41			*35		28	485	602	595	276	187
29	87					24	376	602	532	371	187
30	60					33	334	573	580	382	183
31	80						290		566	329	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	123	41	80.7	4,960
November			b 52	3,090
December			b 44	2,710
January			b 42	2,580
February			b 34	1,890
March			b 38	2,340
April			b 44	2,620
May	580	19	228	14,000
June	776	512	633	37,700
July	653	276	445	27,400
August	722	276	449	27,600
September	334	183	252	15,000
The year	776		196	142,000

* Result of discharge measurement. b Estimated.

Digitized by Google

NORTH ST. VRAIN CREEK NEAR ALLENS PARK, COLO.

LOCATION.—Water-stage recorder in sec. 14, T. 3 N., R. 73 W., 2½ miles north of Allens Park.

DRAINAGE AREA.—33 square miles.

RECORDS AVAILABLE.—October, 1925, to September, 1929.

EXTREMES.—Maximum discharge during year (estimated), 1,000 second-feet June 9, caused by breaking of Copeland Lake Dam; minimum, 6 second-feet during January and February.

1925–1929: Maximum discharge, that of June 9, 1929; minimum, 6 second-feet Apr. 19, 1928, and during January and February, 1929.

REMARKS.—Records good except those for estimated periods, which are fair. Daily discharge not determined Jan. 1 to Mar. 31. Practically no diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	15					18	171	272	170	78
2	26	16				e 10	15	211	270	160	100
3	24	e 16					17	204	230	180	94
4	25	e 16				12	20	213	204	160	90
5	24	e 16			b 9	10	20	244	204	160	102
6	24	16				10	23	e 252	204	170	90
7	25	18	e 11			10	29	e 270	200	154	97
8	23	17				12	34	e 280	182	152	90
9	22	13				7	38	e 300	182	132	84
10	21	17				8	37	e 235	184	117	78
11	21	16				8	32	217	187	107	78
12	21	16				9	38	192	204	94	67
13	23	12				8	54	187	242	100	71
14	24	11	9			e 8	68	192	254	90	73
15	24	10	9			e 9	e 75	214	224	78	84
16	25	10	e 9			e 10	e 77	e 196	217	78	75
17	26	10	9			e 11	e 79	e 210	214	87	71
18	22	e 10	e 9			e 11	e 80	e 190	200	80	75
19	19					e 11	e 82	e 185	204	90	73
20	19					e 12	e 90	e 245	204	92	71
21	20			b 6		e 12	102	e 260	187	87	75
22	18					e 13	104	272	190	84	80
23	19					13	123	250	212	82	80
24	19		e 8			12	125	260	214	64	75
25	18	e 12				10	162	262	202	54	62
26	18					11	169	260	180	51	62
27	18					10	129	272	184	52	58
28	19		8			11	110	274	217	52	56
29	20					10	91	272	187	69	52
30	19		e 8			13	93	267	174	69	48
31	19						116		180	64	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	28	18	21.7	1,330
November	18	10	13.2	786
December	11	8	9.48	583
January			e 6	369
February			e 6	333
March			e 9	553
April	13	7	10.4	619
May	169	15	72.6	4,460
June	300	171	235	14,000
July	272	174	207	12,700
August	180	51	103	6,330
September	102	48	76.3	4,540
The year			64.3	46,600

e Estimated. b Result of discharge measurement.

Digitized by Google

SOUTH ST. VRAIN CREEK NEAR WARD, COLO.

LOCATION.—Water-stage recorder between secs. 35 and 36, T. 2 N., R. 73 W., 2 miles northwest of Ward.
DRAINAGE AREA.—15 square miles.
RECORDS AVAILABLE.—May, 1926, to September, 1927; May to September, 1929.
EXTREMES.—Maximum discharge during year, 231 second-feet June 8 (gage height, 2.06 feet); minimum, 18 second-feet May 21 (gage height, 0.63 foot). 1926–27, 1929: Maximum discharge, 313 second-feet June 7, 1926 (gage height, 2.48 feet); minimum occurred during winter.
REMARKS.—Records good. No diversions above station. Flow regulated by several small lakes.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1		97	146	134	58	16		149	125	81	36
2		129	129	105	52	17		151	124	84	33
3		140	129	138	50	18		131	106	74	30
4		136	125	118	46	19		108	97	68	31
5		136	108	96	45	20		131	100	70	31
6		165	118	148	46	21	20	149	92	90	38
7		179	112	129	40	22	24	163	80	80	37
8		210	98	88	42	23	46	149	87	69	36
9		207	88	75	40	24	60	159	131	80	32
10		183	88	68	37	25	66	163	97	78	28
11		161	96	63	37	26	70	149	84	64	26
12		149	103	55	36	27	87	159	94	64	24
13		140	125	54	36	28	75	159	153	68	25
14		161	165	60	38	29	60	165	98	64	24
15		173	159	82	41	30	58	163	82	56	22
						31	78		133	64	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 21–31	87	20	58.5	1,280
June	210	97	154	9,160
July	165	80	112	6,890
August	148	54	82.8	5,090
September	58	22	36.6	2,180
The period				24,600

Digitized by Google

MIDDLE ST. VRAIN CREEK NEAR ALLENS PARK, COLO.

LOCATION.—Water-stage recorder in sec. 3, T. 2 N., R. 72 W., 9 miles southeast of Allens Park.

DRAINAGE AREA.—28 square miles.

RECORDS AVAILABLE.—April, 1926, to September, 1929.

EXTREMES.—Maximum discharge during year, 240 second-feet June 8 (gage height, 2.45 feet); minimum, 3.1 second-feet Mar. 5.

1926–1929: Maximum discharge, 322 second-feet June 6, 1926 (gage height, 2.65 feet); minimum, that of Mar. 5, 1929.

REMARKS.—Records good except those for estimated periods, which are fair. Daily discharge not determined Nov. 1 to Apr. 27. Practically no diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Jan.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13				18	166	154	150	56
2	12				17	195	154	134	53
3	12				17	181	152	179	56
4	11			*10	19	179	b 130	154	57
5	11		*3.1		20	185	126	150	56
6	11				20	197	b 128	183	56
7	10				23	204	130	181	53
8	11				29	224	114	b 170	50
9	11				34	213	94	116	47
10	11				39	189	92	b 105	45
11	9.8				36	181	b 94	b 90	43
12	9.8				42	164	96	b 75	39
13	9.6				44	157	127	72	40
14	8.6				52	171	152	71	42
15	8.8				62	179	154	67	43
16	9.2				70	162	142	63	37
17	8.6				74	175	138	64	35
18	8.6				76	152	119	62	34
19	8.2				75	145	118	57	36
20	8.6				87	161	132	56	37
21	8.6	*5.4			110	173	118	60	44
22	7.0				119	181	105	63	44
23	7.8				130	173	129	58	40
24	7.0				137	b 180	130	56	35
25	7.2				154	b 180	116	54	31
26	7.0				166	b 180	105	52	29
27	7.2				140	b 184	129	51	26
28	8.2			18	127	b 185	161	52	24
29	8.4			19	113	b 180	106	69	23
30	8.2			22	98	170	102	67	23
31	8.6				122		130	63	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	13	7	9.29	571
November			b 6	357
December			b 6	369
January			b 5	307
February			b 4	222
March			b 3	184
April			b 12	714
May	166	17	73.2	4,500
June	224	145	179	10,700
July	154	92	125	7,690
August	183	51	91.7	5,640
September	57	23	41.1	2,450
The year	224		46.5	33,700

* Result of discharge measurement.

b Estimated.

Digitized by Google

LEFTHAND CREEK NEAR BOULDER, COLO.

LOCATION.—Water-stage recorder in sec. 26, T. 2 N., R. 71 W., 9 miles north of Boulder.

DRAINAGE AREA.—48 square miles.

RECORDS AVAILABLE.—May to September, 1929.

EXTREMES.—Maximum discharge during period, 216 second-feet July 17 (gage height, 2.49 feet); minimum, 27 second-feet Sept. 30 (gage height, 133 feet).

REMARKS.—Records good. Small ditch diverts water just above station. Water diverted from South St. Vrain Creek enters Lefthand Creek 2½ miles above station.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1		103	136	129	61	16	75	138	129	54	42
2		132	127	105	66	17	78	145	138	54	37
3		147	127	140	64	18	75	138	103	53	36
4		154	123	138	58	19	72	123	86	48	35
5		145	103	129	56	20	81	138	86	47	36
6		152	103	180	60	21	90	149	83	50	39
7		152	99	182	53	22	88	156	78	48	39
8		163	96	152	54	23	97	154	96	45	38
9		165	80	127	50	24	101	154	121	45	37
10		158	76	107	47	25	107	154	96	51	33
11		149	84	88	45	26	119	149	81	57	31
12		143	92	80	41	27	121	161	75	55	30
13		123	101	69	39	28	105	156	125	54	30
14		134	129	65	38	29	76	154	99	69	30
15		152	161	57	42	30	66	149	76	66	29
						31	80		107	62	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 16–31	121	66	89.4	2,840
June	165	103	146	8,690
July	161	75	104	6,400
August	182	45	84.1	5,170
September	66	29	43.2	2,570
The period				25,700

Digitized by Google

NORTH BOULDER CREEK NEAR NEDERLAND, COLO.

LOCATION.—Water-stage recorder in sec. 6, T. 1 S., R. 72 W., 2 miles north of Nederland. Prior to Aug. 28, 1929, a chain gage at same site and datum was used.

DRAINAGE AREA.—25 square miles.

RECORDS AVAILABLE.—June to September, 1929.

EXTREMES.—Maximum discharge during period, 259 second-feet Aug. 5 (gage height, 2.6 feet); minimum, 1.0 second-foot Sept. 18 (gage height, 1.16 feet).

REMARKS.—Records fair prior to Aug. 27 and excellent thereafter. Discharge estimated Aug. 21. Diversion for city of Boulder above station. Flow regulated by several lakes at headwaters.

Daily and monthly discharge, in second-feet, 1929

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.
1		138	125	61	16		79	17	25
2		130	95	58	17		121	16	16
3		112	134	65	18		106	8	14
4		103	20	52	19	95	95	9	26
5		103	217	51	20	98	65	27	26
6		98	83	54	21	98	67	28	25
7		92	8	54	22	109	37	29	25
8		83	109	55	23	116	147	58	28
9		81	77	55	24	121	109	51	22
10		77	69	49	25	121	83	51	22
11		75	109	41	26	125	81	46	31
12		71	26	34	27	130	79	15	24
13		67	41	33	28	134	95	23	23
14		71	36	26	29	134	95	30	22
15		60	28	24	30	134	106	28	22
					31		103	44	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
June 19–30	134	95	118	2,810
July	147	37	91.3	5,610
August	217	8	53.5	3,290
September	65	14	35.4	2,110
The period				13,800

Digitized by Google

THOMPSON RIVER BELOW POWER HOUSE, NEAR DRAKE, COLO.

LOCATION.—Water-stage recorder in NW. ¼ sec. 7, T. 5 N., R. 70 W., one-eighth mile above Cedar Creek, a quarter of a mile below city of Loveland's hydroelectric plant, and 4½ miles east of Drake.

DRAINAGE AREA.—277 square miles.

RECORDS AVAILABLE.—October, 1928, to September, 1929. Comparable record at site 3 miles upstream from September, 1917, to December, 1926.

REMARKS.—Records good. Discharge estimated May 27. Observations discontinued Jan. 22 to Apr. 15.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Apr.	May	June	July	Aug.	Sept.
1	58	41	25	18	.....	90	448	597	585	295
2	59	28	28	20	.....	82	578	564	550	278
3	61	19	26	18	.....	80	550	554	597	338
4	58	28	24	17	.....	83	546	526	554	356
5	56	47	26	17	.....	84	597	498	522	329
6	55	46	28	14	.....	90	633	490	673	362
7	53	47	27	16	.....	87	657	466	717	365
8	52	44	25	17	.....	105	709	462	645	353
9	50	41	24	16	.....	124	713	407	571	326
10	49	36	25	15	.....	158	649	398	518	320
11	47	38	24	16	.....	154	629	392	476	315
12	48	38	22	15	.....	147	557	410	445	310
13	48	37	23	15	.....	148	515	473	414	305
14	49	38	22	18	.....	187	550	574	395	308
15	50	36	20	18	.....	241	645	568	365	310
16	51	41	16	17	51	285	582	560	344	310
17	51	38	16	15	57	275	657	536	332	288
18	53	28	17	15	68	300	550	480	386	270
19	56	24	16	16	66	248	484	456	359	260
20	56	23	15	14	77	275	532	484	329	255
21	53	35	15	16	67	338	574	470	312	262
22	51	47	15	.....	67	347	625	445	300	272
23	44	43	13	.....	66	410	633	574	290	270
24	41	37	13	.....	71	431	606	645	278	265
25	39	32	13	.....	52	498	605	540	308	248
26	41	35	14	.....	67	560	597	498	292	239
27	41	37	14	.....	67	500	633	494	265	229
28	38	38	15	.....	66	442	625	741	270	217
29	42	36	16	.....	76	392	621	609	285	209
30	43	30	19	.....	92	335	574	621	335	205
31	41	.....	22	.....	.....	377	.....	609	315	.....

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	61	38	49.5	3,040
November	47	19	36.3	2,160
December	28	13	20.0	1,230
January 1–21	20	14	16.3	679
April 16–30	92	51	67.3	2,000
May	560	80	254	15,600
June	713	448	596	35,500
July	741	392	521	32,000
August	717	265	420	25,800
September	365	205	289	17,200

Digitized by Google

THOMPSON RIVER AT MOUTH OF CANYON, NEAR DRAKE, COLO.

LOCATION.—Water-stage recorder in sec. 4, T. 5 N., R. 70 W., 1 mile above mouth of canyon and 6 miles east of Drake.
DRAINAGE AREA.—301 square miles.
RECORDS AVAILABLE.—March, 1927, to September, 1929.
EXTREMES.—Maximum discharge during year, 1,600 second-feet July 28 (gage height, 5.76 feet); minimum occurred during winter.
1927–1929: Maximum discharge, 1,800 second-feet May 31, 1928 (gage height, 6.00 feet); minimum, 18 second-feet Dec. 9, 1927.
REMARKS.—Records good except those for estimated periods, which are fair. Observations discontinued Oct. 14 to May 13. Diversion for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	May	June	July	Aug.	Sept.	Day	Oct.	May	June	July	Aug.	Sept.
1	45	-------	* 560	748	805	298	16	-------	179	775	670	387	312
2	49	-------	670	670	720	290	17	-------	197	* 740	645	366	288
3	47	-------	630	670	865	378	18	-------	173	* 700	530	372	* 280
4	44	-------	645	620	695	363	19	-------	260	* 630	490	424	* 270
5	44	-------	748	552	645	342	20	-------	242	645	552	381	258
6	43	-------	835	552	1,140	387	21	-------	130	720	530	351	* 270
7	41	-------	835	490	1,060	372	22	-------	116	805	* 530	336	280
8	39	-------	995	490	865	357	23	-------	* 120	835	* 600	330	278
9	38	-------	1,030	417	720	330	24	-------	* 150	775	* 700	318	262
10	38	-------	835	405	620	330	25	-------	* 200	775	695	288	245
11	38	-------	805	393	552	339	26	-------	* 250	748	598	336	235
12	38	-------	670	417	510	327	27	-------	* 240	805	620	272	220
13	37	-------	575	510	490	324	28	-------	* 220	805	1,240	272	208
14	-------	375	645	670	451	333	29	-------	* 200	805	805	303	201
15	-------	258	835	645	417	339	30	-------	* 200	720	865	354	199
							31	-------	* 300	-------	805	309	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October 1–13	49	37	41.6	1,070
May 14–31	375	116	212	7,570
June	1,030	560	753	44,800
July	1,240	393	617	37,900
August	1,140	272	515	31,700
September	387	199	297	17,700

* Estimated.

Digitized by Google

LITTLE THOMPSON RIVER NEAR BERTHOUD, COLO.

LOCATION.—Water-stage recorder in sec. 2, T. 3 N., R. 70 W., 10 miles southwest of Berthoud.
DRAINAGE AREA.—100 square miles.
RECORDS AVAILABLE.—May to September, 1929.
EXTREMES.—Maximum discharge during period, 180 second-feet July 20 (gage height, 2.65 feet); minimum, 0.7 second-foot July 7 (gage height, 0.39 foot).
REMARKS.—Records good. One small ditch diverts water above station.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1		17	1.2	15	10	16		4.5	1.5	20	16
2		15	1.2	10	9.2	17		4.0	1.4	18	14
3		13	1.2	66	8.8	18		3.5	1.5	16	13
4		11	1.1	43	11	19		2.8	10	22	11
5		13	1.1	32	12	20		2.4	34	15	11
6		14	1.1	61	18	21		2.2	24	16	11
7		13	1.0	80	21	22		2.1	7.6	13	11
8		11	1.1	66	21	23		2.0	8.4	13	11
9		9.6	1.1	57	23	24		1.8	24	14	8.4
10		8.8	1.0	49	23	25		1.7	18	13	7.6
11		8.4	1.1	41	23	26	15	1.5	16	13	6.8
12		8.8	1.1	35	21	27	13	1.4	15	12	6.3
13		9.2	1.1	31	19	28	19	1.2	13	10	6.0
14		7.2	1.0	28	18	29	22	1.2	21	8.8	6.0
15		6.0	1.1	27	16	30	16	1.2	17	10	6.3
						31	13		11	11	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 26–31	22	13	16.3	194
June	17	1.2	6.62	394
July	34	1.0	7.74	476
August	80	8.8	27.9	1,720
September	23	6.0	13.3	791
The period				3,580

Digitized by Google

CACHE LA POUDRE RIVER ABOVE CHAMBERS LAKE OUTLET, COLO.

LOCATION.—Water-stage recorder in sec. 28, T. 8 N., R. 75 W., one-fourth mile above Chambers Lake outlet and 11 miles southwest of Home.

DRAINAGE AREA.—91 square miles.

RECORDS AVAILABLE.—May to September, 1929.

EXTREMES.—Maximum discharge during period, 1,720 second-feet June 8 (gage height, 4.4 feet); minimum, 72 second-feet Sept. 29 (gage height, 0.29 foot).

REMARKS.—Records fair. Discharge estimated May 21 and June 22. No water diverted above station. Flow increased by diversion from Colorado River Basin.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1		892	727	315	92	16		1,050	361	112	132
2		1,060	660	254	94	17		1,130	342	125	121
3		943	577	227	115	18		796	321	123	112
4		943	538	216	137	19		820	313	107	104
5		995	500	258	110	20	185	995	297	100	99
6		1,100	465	321	126	21	286	995	282	94	102
7		1,220	448	269	128	22	386	1,000	295	98	104
8		1,370	432	234	126	23	482	1,020	416	87	98
9		1,280	369	203	112	24	577	796	401	94	93
10		1,220	358	181	120	25	750	773	310	90	87
11		1,100	350	159	125	26	843	750	302	88	83
12		868	367	144	151	27	482	796	358	88	77
13		820	448	130	172	28	386	727	401	87	73
14		868	465	123	174	29	318	796	350	96	79
15		1,020	386	118	153	30	361	773	416	102	87
						31	538		353	94	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 20-31	750	185	466	11,100
June	1,370	727	965	57,400
July	727	282	407	25,000
August	321	87	153	9,410
September	174	73	113	6,720
The period				110,000

Digitized by Google

CACHE LA POUDRE RIVER NEAR LOG CABIN, COLO.

LOCATION.—Staff gage in sec. 33, T. 9 N., R. 73 W., half a mile below Sevenmile Creek, half a mile east of Rustic, and 6½ miles southwest of Log Cabin. Zero of gage is 7,092.12 feet above mean sea level.

DRAINAGE AREA.—235 square miles.

RECORDS AVAILABLE.—January, 1909, to December, 1911; May to September, 1929.

EXTREMES.—Maximum discharge during year, 2,750 second-feet June 9 (gage height, 3.60 feet); minimum, 125 second-feet Sept. 26 (gage height, 1.00 foot).

1909–1911, 1929: Maximum discharge, 3,110 second-feet June 19, 1909; minimum, 10 second-feet Feb. 2 and 3, 1911.

REMARKS.—Records good. Diversions for irrigation above station. Flow partly regulated by Chambers Lake.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1		1,660	1,830	592	391	16		2,010	795	265	443
2		2,190	1,660	500	443	17		2,460	748	322	391
3		1,830	1,410	500	500	18		1,740	702	343	174
4		1,740	1,490	417	500	19		1,740	664	322	158
5		1,740	1,490	500	500	20		1,740	625	302	144
6		2,100	1,250	500	472	21		1,740	592	284	146
7		2,370	1,100	500	302	22	559	1,920	559	284	144
8		2,560	960	443	248	23	795	1,920	592	265	140
9		2,560	848	417	199	24	900	1,830	702	265	142
10		2,560	748	343	191	25	1,020	1,920	592	391	133
11		2,460	748	343	205	26	1,580	1,740	559	443	127
12		2,100	748	322	218	27	1,100	2,100	559	443	151
13		1,580	848	284	248	28	848	2,010	702	443	148
14		1,660	900	265	500	29	748	2,010	559	472	148
15		2,100	795	248	530	30	795	2,100	592	472	164
						31	900		559	417	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 22-31	1,580	559	924	18,300
June	2,560	1,580	2,010	120,000
July	1,830	559	869	53,400
August	592	248	384	23,600
September	530	127	273	16,200
The period				232,000

Digitized by Google

SOUTH FORK OF CACHE LA POUDRE RIVER NEAR EGGERS, COLO.

LOCATION.—Water-stage recorder in sec. 36, T. 8 N., R. 73 W., one-third mile above Little Beaver Creek and 8 miles southwest of Eggers.
DRAINAGE AREA.—69 square miles.
RECORDS AVAILABLE.—May to September, 1929.
EXTREMES.—Maximum discharge during period, 359 second-feet June 9 (gage height, 2.38 feet); minimum, 48 second-feet Sept. 29 and 30 (gage height, 1.21 feet).
REMARKS.—Records excellent except those for estimated periods, June 23 and Aug. 27 to Sept. 10, which are fair. Minor diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1		172	222	185	88	16		232	152	75	73
2		235	203	185	90	17		263	149	76	69
3		215	200	177	90	18		200	145	78	68
4		228	191	152	95	19		185	142	78	65
5		248	175	147	95	20		215	145	75	63
6		274	159	175	100	21		232	175	72	66
7		285	162	140	105	22		255	175	73	64
8		329	147	115	95	23	112	240	212	68	65
9		321	117	104	85	24	162	225	225	71	60
10		309	117	95	82	25	213	241	188	75	58
11		293	122	90	79	26	266	248	175	69	57
12		263	149	85	78	27	248	274	215	67	52
13		235	154	82	81	28	280	281	215	75	50
14		248	188	79	85	29	124	270	197	78	48
15		241	162	76	87	30	79	238	194	82	48
						31	142		185	86	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 23-31	280	79	181	3,230
June	329	172	250	14,900
July	225	117	173	10,600
August	185	67	99.5	6,120
September	105	48	74.7	4,440
The period				39,300

Digitized by Google

NORTH FORK OF CACHE LA POUDRE RIVER AT LIVERMORE, COLO.

LOCATION.—Chain gage in sec. 32, T. 10 N., R. 70 W., at Livermore. Zero of gage is 5,717.31 feet above mean sea level.

DRAINAGE AREA.—541 square miles.

RECORDS AVAILABLE.—May to September, 1929.

EXTREMES.—Maximum discharge during period, 486 second-feet May 29 (gage height, 2.74 feet); minimum, 6.5 second-feet July 18 and 19 (gage height, 1.16 feet).

Maximum stage known, 16.2 feet May 20, 1904 (estimated discharge, 20,000 second-feet).

REMARKS.—Records good. Diversions for irrigation above station. Flow regulated by Halligan Reservoir.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1	------	348	14	12	10	16	------	265	8.5	17	30
2	------	366	14	13	10	17	------	273	7.5	14	27
3	------	373	13	130	12	18	------	276	6.5	14	24
4	------	406	12	54	12	19	------	222	6.5	14	22
5	------	432	13	72	14	20	------	136	19	14	22
6	------	466	13	75	17	21	------	113	11	13	20
7	------	443	12	80	26	22	------	95	13	13	19
8	------	443	12	70	29	23	------	89	12	12	17
9	------	384	10	64	67	24	208	70	9.2	12	16
10	------	417	12	64	80	25	276	64	7.5	12	14
11	------	395	12	59	75	26	305	37	8.5	8.5	14
12	------	363	12	57	75	27	316	20	9.2	10	13
13	------	366	11	57	77	28	373	12	13	9.2	13
14	------	327	11	37	59	29	421	13	12	9.2	14
15	------	291	8.5	22	42	30	312	12	12	10	13
						31	319	------	9.2	10	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 24-31	421	208	316	5,010
June	466	12	251	14,900
July	19	6.5	11.1	682
August	130	8.5	34.1	2,100
September	80	10	29.4	1,750
The period	------	------	------	24,400

Digitized by Google

MIDDLE LOUP RIVER AT ST. PAUL, NEBR.

LOCATION.—Chain gage in sec. 10, T. 14 N., R. 10 W., at St. Paul. Zero of gage is 1,778.4 feet above mean sea level.

DRAINAGE AREA.—7,320 square miles.

RECORDS AVAILABLE.—May, 1895, to October, 1897; April to October, 1899; April to November, 1903; August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 9,400 second-feet Mar. 11 (gage height, 3.70 feet); minimum, 302 second-feet Dec. 6 (gage height, 0.96 foot). 1895–1897, 1899, 1903, 1928–29: Maximum discharge, 16,000 second-feet June 6, 1896; minimum, that of Dec. 6, 1928.

REMARKS.—Records fair. Daily discharge not determined for January. No diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a 1,100	2,090					990	1,460	1,570	1,080	700	915
2	a 1,000	1,420	a 617				1,080	1,570	1,260	1,260	635	840
3	a 940	1,260					990	1,570	2,260	1,260	770	840
4	a 900	1,490					915	1,570	2,590	1,460	700	840
5	a 1,000	1,810	594		a 560	a 1,500	990	1,570	2,260	1,570	700	1,080
6	a 1,100	1,790	302				990	1,960	2,110	2,260	700	1,260
7	1,100	1,790					1,350	2,110	6,480	4,000	700	1,350
8	900	1,630	a 372				1,160	2,110	5,120	1,960	635	1,350
9	990	1,570				b 2,650	1,080	1,960	2,950	1,570	700	1,460
10	1,020	1,590			a 792	a 6,500	1,080	2,260	1,700	1,570	770	1,160
11	1,150	1,470				9,400	1,260	3,560	1,570	1,080	1,160	840
12	1,260	1,520				7,380	1,350	2,590	1,260	1,080	915	840
13	1,120	1,380	a 440		b 809	5,350	1,080	2,110	1,260	990	915	915
14	1,120	1,500				2,420	1,080	1,960	990	1,350	880	915
15	1,080	1,610				1,260	990	1,700	915	1,160	840	990
16	1,500	1,830			a 689	840	1,260	1,700	770	915	700	915
17	1,490	1,540	a 400			915	1,160	1,570	840	990	700	990
18	1,080	1,350				840	1,160	1,700	1,160	2,260	700	990
19	915	1,180				990	1,160	1,460	1,160	1,460	770	840
20	1,100	1,180	380			990	1,260	1,460	1,080	840	1,460	915
21	915	990	496			1,080	1,350	1,350	915	915	1,160	700
22	1,120	945	380			1,160	1,160	1,260	990	840	1,570	700
23	1,160	990	428			1,350	1,160	1,260	1,160	840	1,160	770
24	1,080	990				1,350	3,140	1,350	1,260	840	990	840
25	1,130	a 980			a 910	1,260	5,800	1,350	1,160	840	840	990
26	1,130	975	a 558			1,160	4,900	1,700	1,350	840	840	1,080
27	1,250	1,080				1,260	2,260	1,570	1,350	700	840	1,460
28	1,320	1,040				1,080	1,260	1,820	1,350	770	840	1,460
29	1,450	1,130				1,080	1,260	5,800	1,460	635	990	1,260
30	1,420	825	706	b 521	-------	1,090	1,160	5,120	1,260	635	990	1,160
31	1,490	-------	a 700	-------	-------	1,160	-------	3,560	-------	700	915	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,500	900	1,140	70,100
November	2,090	825	1,360	80,900
December	----------	302	487	29,900
January	----------	----------	a 550	33,800
February	----------	----------	743	41,300
March	9,400	840	2,080	128,000
April	5,800	915	1,530	91,000
May	5,800	1,260	2,070	127,000
June	6,480	770	1,720	102,000
July	4,000	635	1,250	76,900
August	1,460	635	877	53,900
September	1,460	700	1,020	60,700
The year	9,400	302	1,240	896,000

a Estimated. b Result of discharge measurement.

Digitized by Google

LOUP RIVER NEAR GENOA, NEBR.

LOCATION.—Chain gage in sec. 25, T. 17 N., R. 4 W., 2 miles south of Genoa. Zero of gage is 1,542.0 feet above mean sea level.

DRAINAGE AREA.—13,400 square miles.

RECORDS AVAILABLE.—August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year (estimated), 20,000 second-feet Mar. 12; minimum occurred during winter.

1928–29: Maximum and minimum discharge, same as given above.

REMARKS.—Records fair. Daily discharge not determined Dec. 1 to Feb. 28. No diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,760	5,570		*2,800	4,100	3,300	1,960	1,570	1,870
2	1,820	4,620		*3,000	3,360	3,000	1,840	1,630	1,920
3	1,760	3,060		3,360	3,580	5,380	2,070	1,570	1,600
4	1,760	3,100		*3,450	3,520	3,640	2,070	1,570	1,620
5	1,870	3,100		*3,600	3,150	4,400	2,480	1,510	1,690
6	1,840	3,300	*4,500	3,690	*3,500	4,220	3,250	1,440	1,870
7	2,150	3,420		4,790	3,640	9,300	9,800	1,470	2,340
8	2,150	3,150		*4,000	*3,400	5,700	7,150	1,430	3,420
9	1,920	3,000		*3,050	*3,200	4,600	3,520	1,390	4,280
10	1,820	3,300		*3,000	3,150	4,160	3,000	1,410	3,580
11	1,890	3,420	*15,000	*3,000	7,690	3,520	2,750	1,590	3,200
12	2,570	3,250	*20,000	*3,050	5,780	3,050	1,870	1,890	3,580
13	2,900	3,250	17,200	*3,100	4,920	4,040	1,960	1,420	2,440
14	3,000	3,050	7,780	*2,800	3,980	3,300	1,840	1,400	2,190
15	2,570	2,900	4,980	*2,600	3,690	2,390	2,520	1,430	2,110
16	2,950		2,850	*2,700	3,980	2,440	2,390	1,400	2,070
17	2,390		2,660	2,620	3,200	2,070	1,960	1,350	1,920
18	2,430		1,790	2,850	*3,000	*9,000	2,110	1,350	1,960
19	2,300		1,690	3,470	2,700	2,390	3,470	1,430	2,110
20	2,660	*2,530	2,520	3,640	*2,500	1,790	2,480	1,960	2,150
21	2,390		3,300	4,340	2,620	1,870	2,190	2,660	2,300
22	2,030		2,520	3,200	2,570	1,600	2,700	1,920	1,920
23	2,220	2,150	1,760	5,240	2,520	1,740	2,660	2,520	1,870
24	2,340	*2,200	4,160	5,180	2,520	1,760	2,340	2,260	1,710
25	2,300	*2,230	3,050	12,100	2,440	1,790	1,570	1,820	1,760
26	2,520	*2,250	2,850	13,800	2,440	1,870	1,630	1,710	1,890
27	2,220	*2,250	3,200	10,600	2,750	2,390	1,790	1,760	2,850
28	2,390	*2,100	2,520	5,780	2,660	2,150	1,520	2,260	2,750
29	2,150	*2,100	2,660	3,740	8,250	1,870	1,500	2,000	2,700
30	2,390	*2,000	2,390	3,250	11,100	2,110	1,640	2,390	2,300
31	3,100	-------	2,850	-------	5,120	-------	1,540	2,000	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	3,100	1,760	2,280	140,000
November	-------	-------	2,880	171,000
December	-------	-------	*1,400	86,100
January	-------	-------	*1,450	89,200
February	-------	-------	*1,750	97,200
March	20,000	-------	4,930	303,000
April	13,800	2,600	4,930	261,000
May	11,100	2,440	3,900	240,000
June	9,300	1,600	3,360	200,000
July	9,800	1,500	2,630	162,000
August	2,660	1,350	1,730	106,000
September	4,280	1,600	2,330	139,000
The year	20,000	-------	2,760	1,990,000

* Estimated

Digitized by Google

NORTH LOUP RIVER NEAR ST. PAUL, NEBR.

LOCATION.—Chain gage in sec. 22, T. 15 N., R. 10 W., 3 miles north of St. Paul.
DRAINAGE AREA.—4,040 square miles.
RECORDS AVAILABLE.—May, 1895, to October, 1897; April to October, 1899; April to December 1903; August, 1928, to September, 1929.
EXTREMES.—Maximum discharge during year (estimated), 22,000 second-feet June 18 (gage height, 5.1 feet); minimum, 637 second-feet Feb. 14.
1895–1897, 1899, 1903, 1928–29: Maximum discharge (estimated), 90,000 second-feet June 6, 1896; minimum, 400 second-feet Nov. 17, 1903. The flood of June 6, 1896, is the greatest known.
REMARKS.—Records fair. Daily discharge not determined Dec. 1 to Feb. 28. No diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	810	1,130				1,090	1,440	1,090	600	e 600	600
2	774	1,260				1,160	1,320	1,090	600	e 760	565
3	756	1,200				1,240	1,160	1,680	600	640	565
4	729	1,040				1,240	1,160	1,440	565	600	680
5	774	1,010				1,240	1,090	1,550	3,780	565	565
6	840	1,100			e1,900	1,240	1,090	2,470	1,970	600	890
7	820	1,140				1,240	1,090	1,810	1,240	600	890
8	830	1,220				1,320	1,090	1,550	1,020	565	1,090
9	870	1,300				1,320	1,160	1,320	955	565	1,160
10	860	1,320				1,240	1,090	1,160	1,090	565	1,020
11	890	1,200			6,540	1,160	1,810	1,160	1,020	565	1,020
12	956	1,130			3,780	1,240	1,440	1,090	955	565	890
13	956	1,100			3,070	1,240	1,440	1,160	890	640	835
14	1,020	1,160		b 637	1,680	1,160	1,320	1,090	835	640	780
15	1,160	1,220			1,320	1,090	1,320	1,090	835	680	835
16	1,110	1,190			1,240	1,020	1,240	955	955	680	730
17	1,080	1,120			1,090	1,090	1,160	890	835	730	730
18	1,020	993			1,020	1,090	1,090	5,400	780	680	730
19	1,000	922			1,020	1,240	890	780	780	780	730
20	944	1,020			955	1,240	890	600	730	835	730
21	990	1,010			955	1,240	890	565	730	890	730
22	968	1,030			955	1,090	890	530	780	780	680
23	956	1,030			1,020	1,320	955	530	890	890	680
24	933	1,020			1,160	2,300	955	530	780	835	680
25	956	1,010			1,320	1,680	955	530	780	780	680
26	944	993			1,160	1,440	955	565	780	730	890
27	922	968			1,090	1,320	955	780	730	955	780
28	968	993			1,020	1,240	1,020	680	e 600	730	780
29	1,010	1,020			1,020	1,160	4,880	680	e 660	730	835
30	1,040	1,030			1,020	1,090	1,810	565	e 765	640	780
31	1,050		b 701		1,020		1,320		e 650	680	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,160	729	933	57,400
November	1,320	922	1,100	65,500
December			e 700	43,000
January			e 700	43,000
February		637	e 750	41,600
March	6,540		1,690	104,000
April	2,300	1,020	1,260	75,000
May	4,880	890	1,290	79,300
June	5,400	530	1,180	70,200
July	3,780	565	941	57,900
August	955	565	693	42,600
September	1,160	565	785	46,700
The year	6,540	637	1,000	726,000

e Estimated.

b Result of discharge measurement.

Digitized by Google

ELKHORN RIVER AT WATERLOO, NEBR.

LOCATION.—Chain gage in sec. 10, T. 15 N., R. 10 E., at Waterloo. Zero of gage is 1,110.1 feet above mean sea level.
DRAINAGE AREA.—6,390 square miles.
RECORDS AVAILABLE.—May, 1911, to July, 1913; August, 1928, to September, 1929.
EXTREMES.—Maximum discharge during year, 6,620 second-feet June 19 (gage height, 5.72 feet); minimum, 273 second-feet Oct. 8 (gage height, 1.64 feet). 1911–1913, 1928–29: Highest flood occurred in April, 1912 (gage height and discharge not determined); minimum discharge, 248 second-feet Sept. 24, 1928.
REMARKS.—Records good except those for Mar. 1–12, which are estimated. Observations discontinued Dec. 6 to Feb. 28. No diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	285	715	702		828	2,150	2,530	1,090	2,690	629
2	290	841	690		820	1,890	4,050	1,790	1,170	510
3	294	709	690	500	869	1,870	3,480	1,120	956	428
4	290	767	664		947	1,590	3,370	930	852	433
5	281	868	690		1,110	1,350	3,410	1,080	716	433
6	281	827	.....	1,100	1,110	1,250	2,170	1,240	687	439
7	281	861	.....	1,100	1,080	1,190	2,690	859	658	480
8	277	922	.....	1,200	1,050	1,150	5,580	1,060	658	504
9	285	1,020	.....	1,300	1,050	1,140	3,300	921	568	568
10	281	1,020	.....	1,400	1,050	1,160	2,360	861	536	609
11	285	970	.....	1,680	1,130	1,640	2,060	844	523	650
12	997	902	.....	3,000	1,410	3,720	1,510	779	616	779
13	915	814	.....	4,560	1,290	2,240	1,300	795	562	709
14	664	794	.....	3,960	1,170	1,670	1,250	771	555	643
15	552	787	.....	2,900	1,140	1,490	1,090	5,620	523	568
16	540	780	.....	1,470	1,090	1,320	1,040	4,440	462	516
17	1,410	773	.....	1,370	984	1,240	1,840	4,350	439	504
18	1,770	741	.....	1,230	939	1,200	2,320	2,230	422	474
19	1,090	722	.....	1,190	1,060	1,130	6,350	2,050	400	486
20	949	690	.....	1,120	1,460	1,090	5,050	1,330	405	480
21	760	670	.....	1,140	1,540	1,000	1,920	1,290	389	468
22	645	651	.....	1,090	1,230	956	2,690	1,160	411	462
23	582	651	.....	1,050	1,110	903	1,720	1,130	394	456
24	552	632	.....	1,020	1,080	836	1,490	1,270	394	456
25	528	607	.....	984	1,130	787	1,040	3,280	433	416
26	528	576	.....	939	1,620	748	974	2,050	416	422
27	499	589	.....	921	1,960	724	1,590	1,560	416	411
28	516	690	.....	895	3,430	693	3,240	1,160	428	433
29	499	626	.....	868	2,690	701	1,570	869	450	450
30	482	683	.....	886	2,210	3,370	1,150	895	439	433
31	510	.....	.....	903	.....	1,270	.....	877	568	.....

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,770	277	584	35,900
November	1,020	576	763	45,400
March	4,560	.....	1,350	83,000
April	3,430	820	1,320	78,600
May	3,720	693	1,400	86,100
June	6,350	974	2,470	147,000
July	5,620	771	1,600	98,400
August	2,690	389	617	37,900
September	779	411	508	30,200

Digitized by Google

TARKIO RIVER BASIN

TARKIO RIVER AT FAIRFAX, MO.

LOCATION.—Chain gage on line between secs. 22 and 27, T. 64 N., R. 40 W., at highway bridge half a mile west of Fairfax.

DRAINAGE AREA.—508 square miles.

RECORDS AVAILABLE.—March, 1922, to September, 1929.

EXTREMES.—Maximum discharge during year, about 15,000 second-feet July 7 (gage height, 20.33 feet); minimum, 48 second-feet Oct. 11 and 12 (gage height, 0.72 foot).

1922–1929: Maximum discharge, that of July 7, 1929; minimum, 1 second-foot Dec. 21, 1924, to Jan. 4, 1925.

REMARKS.—Records fair except those for periods of ice effect, Dec. 21–28 and Jan. 1 to Feb. 25, which are poor. Discharge estimated July 7.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	775	298	146	75	568	218	361	3,870	361	361	116
2	70	1,060	298	146	75	522	180	277	706	180	266	88
3	70	614	298	180	75	1,220	154	266	875	154	237	88
4	70	384	208	256	75	925	146	256	660	146	199	88
5	63	298	116	361	64	950	138	237	499	1,960	190	88
6	58	237	660	361	64	6,350	131	266	453	8,320	199	88
7	54	228	900	298	64	5,180	3,450	256	637	9,000	190	88
8	52	180	752	237	64	1,780	476	228	729	1,320	199	88
9	50	190	706	237	64	1,280	266	208	522	614	199	522
10	50	180	660	237	64	752	875	190	430	407	246	146
11	48	163	637	199	64	2,000	660	3,870	361	3,450	172	116
12	48	154	277	146	64	3,690	430	1,120	361	729	228	146
13	58	146	476	131	64	850	361	591	266	545	154	124
14	58	172	706	101	64	384	706	825	246	499	138	101
15	58	180	499	88	64	340	706	568	237	5,960	131	94
16	82	154	407	75	64	256	499	384	218	2,550	131	108
17	101	1,060	340	75	64	237	298	361	180	900	124	88
18	237	900	266	75	64	277	246	340	277	706	116	82
19	108	545	180	75	64	298	1,120	298	218	499	116	172
20	94	407	180	75	64	266	775	319	298	453	116	116
21	82	384	199	75	75	256	1,540	277	180	430	108	108
22	108	319	237	75	88	246	752	256	2,180	361	101	101
23	88	277	277	75	146	237	522	246	407	340	146	88
24	75	266	277	75	706	218	752	266	384	361	116	82
25	70	256	256	75	660	190	1,030	228	256	340	101	75
26	70	208	237	75	591	180	752	237	228	277	101	75
27	94	228	218	75	591	163	591	228	246	256	94	75
28	70	246	180	75	706	154	614	208	199	228	94	75
29	70	218	190	75	-------	146	476	208	190	208	88	82
30	64	298	163	75	-------	146	407	228	172	3,690	88	75
31	64	-------	154	75	-------	218	-------	208	-------	568	101	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	237	48	75.9	0.149	0.17
November	1,060	146	358	.705	.79
December	900	116	363	.715	.82
January	361	75	139	.274	.32
February	706	64	175	.344	.36
March	6,350	146	977	1.92	2.21
April	3,450	131	642	1.26	1.41
May	3,870	190	446	.878	1.01
June	3,870	172	550	1.08	1.20
July	9,000	146	1,480	2.91	3.36
August	361	88	156	.307	.35
September	522	75	113	.222	.25
The year	9,000	48	459	.904	12.25

Digitized by Google

NODAWAY RIVER BASIN

NODAWAY RIVER NEAR BURLINGTON JUNCTION, MO.

LOCATION.—Chain gage in sec. 17, T. 65 N., R. 37 W., at bridge on State highway No. 18, 1½ miles west of Burlington Junction. Chain gage one-fourth mile upstream used October 24, 1928, to June 11, 1929.

DRAINAGE AREA.—1,240 square miles.

RECORDS AVAILABLE.—March, 1922, to September, 1929.

EXTREMES.—Maximum discharge during year, about 21,000 second-feet July 6 (gage height, 19.40 feet); minimum, 46 second-feet Sept. 3 and 4 (gage height, 2.34 feet).

1922–1929: Maximum discharge, that of July 6, 1929; maximum gage height, 19.5 feet Sept. 3, 1926; minimum discharge, 6 second-feet June 1 and July 26, 1925.

REMARKS.—Records fair except those for period of ice effect, Jan. 2 to Mar. 4, which are poor. Discharge estimated Aug. 5–8 and 29.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	103	170	630	1,100	147	1,100	585	1,100	8,860	282	1,450	80
2	100	2,640	730	970	147	1,100	630	790	2,040	235	1,030	65
3	96	1,800	970	850	147	1,100	540	630	3,180	170	520	46
4	90	2,040	1,030	730	147	1,170	540	540	1,520	182	520	46
5	86	1,380	1,380	630	147	1,310	500	500	420	170	442	54
6	80	1,240	1,520	630	147	5,340	520	480	790	12,000	365	65
7	72	850	1,450	630	147	4,600	3,900	480	480	1,660	288	54
8	72	630	1,450	585	147	3,540	3,360	420	2,370	520	211	47
9	70	500	1,380	500	147	3,450	1,960	402	2,280	368	134	129
10	56	460	1,450	385	147	2,910	1,380	368	1,520	206	147	206
11	59	440	1,450	315	147	4,600	4,300	5,670	910	5,560	105	182
12	62	420	1,520	250	147	11,800	2,460	4,500	585	730	98	182
13	73	368	2,910	220	147	14,000	2,040	4,000	460	206	88	121
14	62	420	2,120	220	147	10,400	1,960	3,360	540	170	80	105
15	56	420	1,960	220	147	4,200	3,360	1,800	368	9,560	85	80
16	134	970	1,730	220	147	2,120	2,280	1,450	368	4,400	78	85
17	170	4,200	1,660	193	147	1,520	1,660	850	282	1,590	76	79
18	500	3,360	1,660	193	147	1,450	1,100	585	402	790	67	54
19	1,240	3,090	3,180	193	147	1,240	4,000	500	282	520	67	96
20	680	2,200	3,090	193	170	1,100	3,720	460	250	402	65	182
21	402	1,240	3,090	193	170	910	7,340	420	193	315	59	220
22	350	910	3,000	193	193	790	3,360	368	2,550	298	59	158
23	250	730	3,000	193	193	790	2,200	350	585	266	67	125
24	193	680	3,000	170	220	790	2,460	402	315	2,200	65	113
25	193	585	2,820	170	250	385	5,010	332	235	1,590	59	85
26	182	500	2,910	170	850	385	3,630	298	220	562	58	76
27	385	480	2,910	170	1,100	368	2,550	266	182	402	59	56
28	298	562	2,820	170	1,170	368	3,450	250	145	182	56	54
29	147	540	1,730	170	-------	350	2,550	220	193	117	54	51
30	143	1,310	1,590	147	-------	350	1,660	500	170	98	51	51
31	129	-------	2,120	147	-------	460	-------	500	-------	2,370	56	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,240	56	211	0.170	0.20
November	4,200	170	1,170	.944	1.05
December	3,180	630	2,010	1.62	1.87
January	1,100	147	359	.290	.33
February	1,170	147	254	.205	.21
March	14,000	350	2,710	2.19	2.52
April	7,340	500	2,500	2.02	2.25
May	5,670	220	1,060	.855	.99
June	8,860	145	1,090	.879	.98
July	12,000	98	1,550	1.25	1.44
August	1,450	51	212	.171	.20
September	220	46	98.3	.079	.09
The year	14,000	46	1,110	.895	12.13

Digitized by Google

PLATTE RIVER BASIN (IOWA-MISSOURI)

PLATTE RIVER AT CONCEPTION JUNCTION, MO.

LOCATION.—Chain gage on line between NW. ¼ sec. 14 and SW. ¼ sec. 11, T. 63 N., R. 34 W., at highway bridge half a mile west of Conception Junction.

DRAINAGE AREA.—492 square miles.

RECORDS AVAILABLE.—July, 1921, to May, 1925; August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 12,200 second-feet July 6 (gage height, 21.70 feet); minimum, 6 second-feet Aug. 10, 21, Sept. 6 and 16 (gage height, 4.34 feet).

1921–1929: Maximum discharge, that of July 6, 1929; minimum, 0.48 second-foot Jan. 30, 1922.

REMARKS.—Records fair except those for period of ice effect, Jan. 2 to Mar. 3, which are poor. Discharge estimated Nov. 10, May 1, and Aug. 7–9.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45	124	430	62	45	638	2,080	400	1,560	28	21	13
2	44	3,410	454	53	45	554	845	234	2,920	21	17	49
3	43	2,640	604	45	45	554	717	196	3,410	16	15	92
4	43	1,710	408	45	45	582	373	169	1,710	10	13	18
5	42	1,020	408	37	45	840	234	169	568	21	11	7
6	40	722	342	37	45	1,330	224	160	288	8,990	10	6
7	39	454	238	45	45	1,810	205	151	224	1,810	9	7
8	37	342	101	53	45	1,020	655	151	205	348	8	7
9	36	238	101	53	45	1,920	481	142	323	160	7	8
10	34	210	96	62	45	1,860	597	125	224	92	6	9
11	33	183	91	62	37	1,980	1,380	178	160	1,860	14	8
12	31	174	86	62	37	2,640	1,460	1,280	134	427	14	11
13	53	137	278	62	37	5,550	686	1,610	116	134	13	10
14	30	144	1,760	53	37	5,280	427	568	323	98	11	9
15	30	130	1,610	53	37	2,130	2,130	539	151	3,200	14	12
16	48	238	840	53	37	1,420	950	234	95	1,200	15	6
17	86	4,270	454	53	37	1,200	568	224	86	300	12	7
18	1,290	6,350	478	53	37	950	539	178	80	151	7	7
19	722	2,780	151	53	37	779	779	125	62	108	7	8
20	582	1,170	118	53	37	748	3,410	116	37	62	7	15
21	342	454	112	53	37	597	5,100	108	33	49	6	18
22	278	342	106	53	37	373	3,270	105	59	18	10	24
23	430	278	101	45	62	348	2,300	102	108	28	11	21
24	278	201	86	45	81	323	1,960	95	71	21	10	24
25	124	201	81	45	112	373	1,330	92	59	33	10	12
26	112	192	91	45	298	323	2,530	86	28	21	7	8
27	192	137	91	45	840	277	1,030	80	33	17	16	18
28	166	151	81	45	900	254	950	83	28	15	10	10
29	158	144	91	45	-------	234	2,350	80	21	13	8	9
30	101	238	86	45	-------	214	717	74	14	28	9	10
31	106	-------	81	45	-------	277	-------	71	-------	33	11	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,290	30	180	0.366	0.42
November	6,350	124	959	1.95	2.18
December	1,760	81	327	.665	.77
January	62	37	50.3	.102	.12
February	900	37	114	.232	.24
March	5,550	214	1,210	2.46	2.84
April	5,100	205	1,340	2.72	3.04
May	1,610	71	256	.520	.60
June	3,410	14	438	.890	.99
July	8,990	10	623	1.27	1.46
August	21	6	10.9	.022	.03
September	92	6	15.2	.031	.03
The year	8,990	6	461	.937	12.72

Digitized by Google

PLATTE RIVER AT AGENCY, MO.

LOCATION.—Chain gage in NE. ¼ sec. 29, T. 56 N., R. 34 W., at highway bridge in Agency.

DRAINAGE AREA.—1,790 square miles.

RECORDS AVAILABLE.—May, 1924, to September, 1929.

EXTREMES.—Maximum discharge during year, 22,300 second-feet June 3 (gage height, 26.60 feet); minimum, 55 second-feet Sept. 16, 17, and 30 (gage height, 1.96 feet).

1924–1929: Maximum discharge, 22,600 second-feet Sept. 18, 1926 (gage height, 26.83 feet); minimum discharge, 24 second-feet several days during September and December, 1927, and January, 1928; minimum gage height, 1.42 feet Jan. 30 and 31, 1928.

Maximum stage known, 31.4 feet in July, 1915.

REMARKS.—Records fair except those for period of ice effect, Jan. 2 to Feb. 24, which are poor. Discharge estimated Nov. 10–14.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	156	4,280	3,780	394	144	8,220	3,080	3,300	8,460	552	215	212
2	144	6,110	4,390	334	144	7,860	3,730	2,870	14,800	436	278	218
3	139	8,540	3,350	296	144	6,110	2,320	2,540	21,200	552	244	196
4	134	10,100	2,330	260	144	7,340	1,170	2,110	17,100	458	228	171
5	125	6,050	1,430	196	144	7,860	758	1,540	10,300	602	215	161
6	120	3,950	758	168	144	8,700	577	1,070	5,640	2,760	188	134
7	130	2,540	414	168	144	9,050	436	628	3,410	11,800	166	107
8	116	1,590	628	168	144	8,460	374	481	2,430	19,400	154	96
9	94	1,070	914	168	144	7,730	315	436	1,850	8,540	168	78
10	86	700	1,540	168	144	7,280	706	1,330	1,490	4,620	163	78
11	75	600	2,010	168	120	7,730	2,110	2,330	1,070	2,870	151	75
12	130	520	2,380	168	120	8,140	2,970	3,030	810	1,800	144	70
13	163	480	2,700	144	120	8,620	3,680	2,540	706	4,000	139	66
14	414	450	1,950	144	120	9,500	4,340	2,270	577	3,030	137	63
15	758	2,330	1,540	144	120	10,600	6,340	1,590	810	2,270	132	58
16	1,330	5,930	1,330	144	120	10,300	6,340	1,490	706	1,850	134	55
17	1,950	8,960	1,280	144	120	5,700	5,010	1,380	552	1,170	132	55
18	3,350	15,200	1,280	144	144	4,280	5,760	1,230	374	481	127	66
19	3,680	14,500	1,170	144	144	3,620	7,400	914	458	414	122	70
20	3,510	11,100	1,070	144	168	2,760	10,100	552	2,060	436	374	64
21	2,810	5,990	1,020	144	168	2,060	15,500	414	2,810	414	354	61
22	1,800	2,970	914	144	196	1,540	17,600	374	3,620	374	296	60
23	1,230	1,950	862	144	260	1,070	10,100	334	2,430	354	244	58
24	914	1,280	810	144	862	966	5,120	334	1,750	334	218	70
25	758	1,070	810	144	4,670	966	3,350	315	1,120	278	228	70
26	552	810	758	144	6,220	914	5,180	315	862	185	296	70
27	374	706	552	144	6,860	810	7,400	296	810	125	354	66
28	278	528	458	144	7,280	602	5,930	260	810	109	374	64
29	218	654	458	144	-------	481	4,670	260	706	94	278	58
30	154	2,060	436	144	-------	1,640	3,890	244	654	84	260	55
31	1,380	-------	436	144	-------	2,320	-------	4,060	-------	86	228	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	3,680	75	873	0.488	0.56
November	15,200	450	4,100	2.29	2.56
December	4,390	414	1,410	.788	.91
January	394	144	174	.097	.11
February	7,280	120	1,040	.581	.60
March	10,600	481	5,270	2.94	3.39
April	17,600	315	4,880	2.73	3.05
May	4,060	244	1,320	.737	.85
June	21,200	374	3,680	2.06	2.30
July	19,400	84	2,270	1.27	1.46
August	374	122	217	.121	.14
September	218	55	90.8	.051	.06
The year	21,200	55	2,110	1.18	15.99

Digitized by Google

KANSAS RIVER BASIN

REPUBLICAN RIVER AT MAX, NEBR.

LOCATION.—Staff gage in sec. 32, T. 2 N., R. 36 W., three-quarters of a mile south of Max. Zero of gage is 2,873.6 feet above mean sea level.
DRAINAGE AREA.—6,220 square miles.
RECORDS AVAILABLE.—August, 1928, to September, 1929.
EXTREMES.—Maximum discharge during year, 1,160 second-feet June 7 (gage height, 2.60 feet); river dry during parts of July and August.
1928–29: Maximum and mimimum discharge, same as given above.
REMARKS.—Records good except those for Mar. 1–6, which are estimated. Observations discontinued Dec. 3 to Feb. 28. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet 1928–29

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	77	338	175	200	190	294	114	46	54	11
2	83	280	175	200	180	294	154	34	61	158
3	83	242	.....	250	190	287	132	74	54	158
4	77	219	.....	300	185	280	118	74	46	9
5	88	224	.....	400	174	336	110	34	31	67
6	88	224	.....	500	154	570	280	27	29	77
7	88	230	.....	511	145	457	819	20	41	136
8	88	219	.....	287	158	382	366	14	34	145
9	94	230	.....	255	174	322	237	14	26	163
10	91	224	.....	237	185	315	185	9	36	145
11	88	208	.....	237	185	294	150	5	29	140
12	99	214	.....	243	185	261	118	0	26	145
13	106	219	.....	255	168	268	122	0	22	140
14	197	208	.....	230	196	249	122	0	20	122
15	186	202	.....	230	185	230	118	0	16	122
16	171	202	.....	249	168	185	118	0	11	107
17	158	208	.....	237	185	218	107	0	5	105
18	141	175	.....	230	196	140	84	0	5	88
19	132	171	.....	224	196	150	77	67	4	93
20	122	145	.....	230	350	163	64	31	4	88
21	122	180	.....	237	493	145	54	9	0	88
22	125	186	.....	243	448	145	51	0	0	88
23	129	162	.....	230	350	145	58	590	0	84
24	125	158	.....	243	329	136	41	493	0	74
25	122	162	.....	243	358	127	34	261	0	67
26	119	158	.....	243	350	114	24	185	0	67
27	116	180	.....	224	350	95	24	140	0	67
28	119	180	.....	190	350	95	20	114	16	67
29	149	180	.....	185	329	158	16	107	16	80
30	158	180	.....	190	308	140	64	84	16	77
31	180	.....	.....	207	.....	118	.....	67	16	.....

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	197	77	120	7,380
November	338	145	204	12,100
March	511	185	256	15,700
April	493	145	247	14,700
May	570	95	229	14,100
June	819	16	133	7,910
July	590	0	80.6	4,960
August	61	0	19.9	1,220
September	163	9	99.6	5,960

Digitized by Google

REPUBLICAN RIVER NEAR BLOOMINGTON, NEBR.

LOCATION.—Chain gage in sec. 8, T. 1 N., R. 15 W., 2 miles south of Bloomington. Zero of gage is 1,822.5 feet above mean sea level.
DRAINAGE AREA.—19,000 square miles.
RECORDS AVAILABLE.—April to September, 1929.
EXTREMES.—Maximum discharge during period, 10,600 second-feet June 9 (gage height, 8.44 feet); minimum, 109 second-feet Sept. 3.
REMARKS.—Records good. Minor diversions for irrigation.

Daily and monthly discharge, in second-feet 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	-------	1,040	2,650	317	501	115	16	523	755	1,410	283	146	171
2	-------	930	2,190	300	416	120	17	523	722	1,250	283	134	168
3	-------	825	1,740	283	375	109	18	523	690	930	283	136	155
4	-------	755	1,250	283	336	132	19	546	658	825	236	130	161
5	-------	722	965	267	300	134	20	598	658	755	221	128	153
6	-------	755	895	267	267	132	21	658	625	658	416	120	146
7	-------	755	2,460	251	251	126	22	722	625	658	300	115	146
8	-------	825	8,560	336	236	134	23	690	598	570	236	115	138
9	-------	965	8,850	825	216	157	24	790	598	546	755	113	136
10	-------	1,100	4,370	658	202	164	25	2,280	570	501	5,260	111	128
11	-------	1,140	3,640	479	191	157	26	4,220	546	437	8,560	130	132
12	-------	1,000	2,460	458	184	153	27	2,370	570	395	6,570	155	132
13	501	895	2,010	437	171	166	28	1,830	523	395	2,950	146	138
14	501	860	1,570	375	168	173	29	1,490	501	375	1,570	142	134
15	501	790	1,490	300	157	166	30	1,210	4,220	336	825	136	138
							31	-------	2,370	-------	625	124	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 13-30	4,220	501	1,140	40,700
May	4,220	501	922	56,700
June	8,850	336	1,840	109,000
July	8,560	221	1,140	70,100
August	501	111	195	12,000
September	173	109	144	8,570
The period				297,000

Digitized by Google

REPUBLICAN RIVER AT SCANDIA, KANS.

LOCATION.—Chain gage in NE. ¼ sec. 17, T. 3 S., R. 4 W., at Scandia, 4 miles below Dry Creek.

DRAINAGE AREA.—23,000 square miles.

RECORDS AVAILABLE.—August, 1919 to July, 1925; August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 8,780 second-feet June 10 (gage height, 8.10 feet); minimum, 109 second-feet Aug. 24 (gage height, 1.65 feet).

1919–1925, 1928–29: Maximum discharge, 16,700 second-feet June 12, 1923 (gage height, 11.4 feet); minimum, 2 second-feet Oct. 9, 15, and 16, 1922 (gage height, 1.50 feet).

Maximum stage known, 14.2 feet, present datum, June 30, 1915.

REMARKS.—Records good except those for period of ice effect, Jan. 1 to Mar. 8, which are fair. Discharge estimated July 4. Power-plant operation at Superior, Nebr., probably causes slight fluctuations during low flow.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1	150	409	441	545	284	960	620	1,380	3,180	229	912	214
2	150	740	441	473	284	1,620	660	545	2,440	187	509	130
3	157	660	441	545	264	1,740	660	582	2,870	166	582	130
4	150	620	409	545	264	1,880	660	740	2,150	206	441	130
5	157	582	381	473	246	1,880	660	912	1,880	246	409	125
6	157	582	381	353	264	1,500	660	865	1,270	246	246	136
7	150	545	353	353	246	1,380	582	740	1,010	187	229	136
8	142	582	353	353	229	1,380	582	780	912	199	284	157
9	150	545	329	353	246	2,010	582	780	7,730	166	246	166
10	142	545	329	305	246	2,010	582	700	7,520	284	229	157
11	142	545	329	353	284	2,150	660	1,010	4,250	409	246	166
12	545	509	353	353	264	2,010	545	1,440	3,350	545	229	246
13	3,530	509	409	305	246	1,740	545	1,160	4,070	545	199	175
14	1,330	509	473	409	305	1,500	509	1,110	2,150	305	187	246
15	912	473	545	409	381	1,330	740	912	1,880	409	187	150
16	1,010	381	545	353	381	1,220	620	780	1,500	284	187	214
17	1,060	284	545	353	353	1,060	620	780	1,500	353	187	150
18	700	246	582	329	305	960	620	740	1,500	384	187	150
19	264	214	620	305	284	912	660	620	1,160	409	187	157
20	264	229	620	329	264	812	700	812	1,010	305	175	214
21	264	246	582	329	246	780	620	1,270	960	284	150	175
22	246	329	509	353	246	660	780	865	812	214	150	166
23	264	441	409	353	229	545	700	620	1,620	264	142	157
24	305	473	409	305	246	660	660	582	1,220	329	136	136
25	284	441	409	329	381	700	740	620	740	264	175	136
26	264	409	441	381	409	700	700	509	620	264	142	187
27	264	409	473	381	473	660	5,360	620	545	3,530	142	142
28	264	441	545	353	700	620	2,870	865	441	5,550	175	157
29	284	441	582	329	-------	700	2,150	509	329	2,870	305	157
30	284	409	620	305	-------	660	1,880	582	1,110	2,010	329	150
31	329	-------	740	305	-------	620	-------	620	-------	1,740	264	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	3,530	142	462	28,400
November	740	214	458	27,300
December	740	329	471	29,000
January	545	305	372	22,900
February	700	229	306	17,000
March	2,150	545	1,200	73,800
April	5,360	509	964	57,400
May	1,440	509	808	49,700
June	7,730	329	2,060	123,000
July	5,550	166	754	46,400
August	912	136	263	16,200
September	246	125	164	9,760
The year	7,730	125	691	501,000

Digitized by Google

REPUBLICAN RIVER AT WAKEFIELD, KANS.

LOCATION.—Chain gage in NE. ¼ sec. 5, T. 10 S., R. 4 E., at highway bridge one-fourth mile north of Union Pacific Railroad station at Wakefield.

DRAINAGE AREA.—24,700 square miles.

RECORDS AVAILABLE.—June, 1917, to September, 1929.

EXTREMES.—Maximum discharge during year, 8,560 second-feet June 11 (gage height, 8.60 feet); minimum, 47 second-feet Sept. 21 (gage height, 2.31 feet).

1917–1929: Maximum discharge, 20,100 second-feet June 4, 1923 (gage height, 12.86 feet); minimum, 16 second-feet Oct. 21, 1922.

REMARKS.—Records good except those for period of ice effect, Jan. 5 to Mar. 4, which are fair. Discharge estimated Dec. 12, Jan. 27, 29, 31, and Feb. 25. Regulation caused by operation of power plant at Clay Center.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	480	742	775	570	404	920	920	2,120	679	895	2,250	249
2	422	960	775	460	387	1,080	882	1,890	4,890	855	1,670	246
3	387	1,080	742	570	387	1,680	882	1,560	4,110	744	1,160	238
4	387	1,000	742	545	370	4,040	920	1,460	2,920	649	985	238
5	387	1,080	680	545	370	3,540	882	1,360	2,780	619	815	186
6	387	1,000	595	550	340	3,060	845	1,260	2,250	564	712	128
7	387	960	545	550	370	1,580	742	1,160	2,510	592	619	150
8	387	920	570	525	340	1,470	1,180	1,075	2,000	489	538	208
9	354	1,000	545	500	325	1,470	1,130	1,075	2,640	538	538	175
10	387	1,000	522	500	370	1,680	845	1,030	2,120	513	538	257
11	297	920	650	500	354	1,900	920	1,890	8,350	855	489	316
12	325	982	636	510	387	2,020	845	6,890	5,890	1,120	465	253
13	354	920	622	520	370	2,250	845	4,300	4,490	679	420	215
14	404	845	680	520	354	2,020	845	2,640	3,570	649	377	101
15	2,630	845	680	520	404	1,680	845	2,000	3,070	780	356	150
16	1,900	775	710	480	440	1,580	775	1,670	2,510	592	356	128
17	1,180	1,180	710	440	480	1,470	742	1,360	2,120	538	296	132
18	1,080	1,580	775	440	450	1,370	775	1,260	1,780	513	316	97
19	1,180	1,130	810	460	420	1,270	4,890	1,160	1,670	489	276	94
20	882	920	680	460	400	1,270	6,900	1,260	5,290	465	296	87
21	742	845	650	480	380	1,180	3,930	1,460	3,750	442	276	70
22	680	810	545	480	360	1,040	2,780	1,160	2,250	513	257	142
23	650	810	480	480	350	1,080	1,890	1,260	2,510	420	257	122
24	622	775	545	480	320	1,000	1,560	1,360	7,300	420	780	142
25	650	775	710	404	370	1,000	1,360	985	5,290	356	215	128
26	650	775	810	440	420	1,000	1,160	895	2,780	336	215	128
27	622	775	810	450	460	960	1,160	780	1,890	398	215	118
28	650	775	810	460	500	960	1,120	744	1,360	398	223	118
29	570	810	810	460	-------	1,000	3,750	744	1,160	5,090	253	118
30	622	775	775	460	-------	960	2,780	712	1,030	4,300	215	115
31	650	-------	810	460	-------	920	-------	855	-------	2,920	238	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2,630	297	687	42,200
November	1,580	742	922	54,900
December	810	480	684	42,100
January	570	-------	491	30,200
February	-------	-------	389	21,600
March	4,040	920	1,560	95,900
April	6,900	742	1,640	97,600
May	6,890	712	1,590	97,800
June	8,350	679	3,160	188,000
July	5,090	336	927	57,000
August	2,250	215	536	33,000
September	316	70	162	9,640
The year	8,350	70	1,060	770,000

Digitized by Google

KANSAS RIVER AT OGDEN, KANS.

LOCATION.—Chain gage in SE. ¼ sec. 12, T. 11 S., R. 6 E., three-fourths mile south of Ogden and 10 miles below junction of Smoky Hill and Republican Rivers, which unite to form Kansas River.

DRAINAGE AREA.—45,200 square miles.

RECORDS AVAILABLE.—June, 1917, to September, 1929.

EXTREMES.—Maximum discharge during year, 23,100 second-feet May 12 (gage height, 16.23 feet); minimum, about 600 second-feet probably occurred in February.

1917–1929: Maximum discharge, 32,600 second-feet June 10, 1923 (gage height, 18.15 feet); minimum, 103 second-feet Oct. 30, 1922.

REMARKS.—Records good except those for Nov. 16 to May 15, which are fair. Stage-discharge relation affected by ice Jan. 5–10 and Jan. 13 to Mar. 1. Flow affected by operation of power plants on tributaries.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,620	1,550	1,620	1,420	820	4,230	2,280	3,580	7,760	2,500	5,320	1,120
2	1,620	1,790	1,620	1,360	820	5,730	2,280	3,000	13,000	2,280	4,400	1,120
3	1,620	1,700	1,550	1,300	765	6,160	2,080	2,740	10,900	2,180	3,430	1,120
4	1,550	1,790	1,550	1,240	710	7,050	1,880	2,500	11,700	1,980	2,740	1,060
5	1,480	1,790	1,550	1,150	820	8,240	1,880	2,280	9,200	1,880	2,280	1,000
6	1,480	1,790	1,420	1,060	710	5,320	1,790	2,280	8,720	1,880	2,180	1,000
7	1,480	1,700	1,420	976	710	4,060	1,790	2,080	8,000	1,980	1,980	1,000
8	1,480	1,620	1,420	888	660	3,280	1,700	2,080	7,280	1,880	1,880	1,120
9	1,480	1,700	1,360	800		3,000	2,080	1,980	5,730	1,700	1,790	1,620
10	1,480	1,620	1,360	1,700		2,740	1,980	1,880	6,600	1,700	1,880	1,300
11	1,360	1,700	1,360	1,980	620	2,740	1,790	4,230	11,200	1,790	3,140	1,060
12	1,360	1,620	1,360	2,080		3,140	1,790	22,400	14,400	6,160	3,740	1,060
13	1,420	1,620	1,420	1,700		3,000	1,790	17,500	13,000	13,300	3,000	1,060
14	1,420	1,550	1,420	1,620	660	3,280	1,700	16,000	12,700	12,700	2,180	1,060
15	1,790	1,550	1,420	1,700	710	2,870	2,500	13,800	11,400	12,700	2,080	1,000
16	2,620	1,550	1,360	1,550	660	2,740	2,180	12,200	6,820	10,400	1,790	1,000
17	2,180	8,000	1,420	1,700	1,060	2,620	1,980	10,900	4,930	7,520	1,550	1,000
18	1,880	8,960	1,420	1,700	1,420	2,500	1,880	9,680	4,400	6,380	1,480	940
19	2,280	4,930	1,420	1,880	1,880	2,390	3,000	9,440	3,900	4,930	1,420	1,060
20	2,180	2,870	1,420	1,480	1,420	2,280	14,800	6,820	4,930	3,580	1,060	940
21	1,880	2,280	1,360	1,300	1,240	2,180	18,500	4,750	7,280	2,870	1,360	880
22	1,700	2,080	1,300	1,420	1,180	2,180	13,000	4,060	5,320	2,620	1,240	940
23	1,620	1,880	1,300	1,060	1,700	2,080	10,400	3,740	4,570	2,870	1,240	880
24	1,550	1,880	1,300	1,060	1,180	2,080	9,440	3,900	7,050	3,140	1,240	940
25	1,550	1,790	1,360	940	1,980	2,080	8,960	3,900	10,200	2,870	1,240	940
26	1,480	1,700	1,360	940	1,700	1,980	6,820	3,280	7,050	2,740	1,240	940
27	1,420	1,700	1,360	940	2,280	1,880	4,060	3,000	4,750	2,390	1,180	880
28	1,420	1,620	1,360	1,000	2,740	1,880	3,000	2,740	4,060	2,080	1,240	820
29	1,480	1,620	1,360	1,000	-------	1,880	3,580	2,500	3,280	3,420	1,180	820
30	1,420	1,620	1,300	940	-------	1,880	4,400	2,390	2,740	5,520	1,180	820
31	1,420	-------	1,300	820	-------	2,280	-------	2,500	-------	6,380	1,180	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2,620	1,360	1,640	101,000
November	8,960	1,550	2,320	138,000
December	1,620	1,300	1,400	86,100
January	2,080	800	1,310	80,600
February	2,740	-------	1,100	61,100
March	8,240	1,880	3,220	198,000
April	18,500	1,700	4,510	26,800
May	22,400	1,880	5,940	365,000
June	14,400	2,740	7,760	462,000
July	13,300	1,700	4,400	271,000
August	5,320	1,060	2,030	125,000
September	1,620	820	1,020	607,000
The year	22,400	-------	3,060	1,980,000

Digitized by Google

KANSAS RIVER AT WAMEGO, KANS.

LOCATION.—Chain gage in SE. ¼ sec. 9, T. 10 S., R. 10 E., at Wamego, 3 miles below Antelope Creek.

DRAINAGE AREA.—54,900 square miles.

RECORDS AVAILABLE.—January, 1919, to September, 1929.

EXTREMES.—Maximum discharge during year, 38,600 second-feet June 2 (gage height, 13.7 feet); minimum, 1,050 second-feet Oct. 15.

1919–1929: Maximum discharge, 46,600 second-feet June 10, 1923 (gage height, 15.8 feet); minimum, 330 second-feet several days in October, 1922.

REMARKS.—Records good except those for period of ice effect, Jan. 5 to Feb. 18, and those for Apr. 22 to May 27, which are fair. Low flow may be affected by operation of power plants on tributaries. Gage-height record furnished by United States Weather Bureau.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,550	2,170	3,030	2,050		7,790	3,620	7,550	28,200	5,480	7,790	1,630
2	1,410	2,710	2,850	2,050		9,250	3,420	6,400	35,900	5,260	6,860	1,760
3	1,410	3,080	2,680	2,050	1,700	8,030	3,420	5,940	30,900	4,830	5,940	1,630
4	1,410	3,670	3,620	2,050		12,600	3,420	5,260	21,600	4,620	4,830	1,630
5	1,410	5,170	3,030	2,000		18,600	3,030	5,260	19,400	4,020	4,220	1,630
6	1,410	4,730	3,030			17,200	2,850	5,040	14,500	3,820	3,820	1,630
7	1,410	4,300	2,510			20,800	2,680	4,620	12,900	3,820	3,620	1,630
8	1,280	4,300	2,350	2,000		16,200	3,030	4,420	12,000	4,020	3,220	1,500
9	1,280	4,730	2,350			9,510	4,830	4,220	10,300	3,620	3,030	1,500
10	1,280	4,300	2,350			9,250	4,420	4,020	10,000	3,620	3,030	2,680
11	1 160	4,300	2,510			7,320	3,220	4,220	10,300	4,220	3,220	2,200
12	1,160	3,880	2,510		1,600	7,320	2,680	27,300	17,200	4,830	5,040	1,900
13	1,160	3,470	2,350	2,600		7,320	2,680	31,900	15,800	14,500	5,480	1,760
14	1,160	3,270	3,030			7,090	2,680	26,400	15,800	14,200	4,420	1,760
15	1,050	3,080	2,680			6,630	2,850	19,400	13,200	14,200	3,220	1,630
16	4,730	2,890	2,680			5,480	4,420	16,200	10,000	15,200	3,030	1,500
17	8,750	8,450	2,510			5,040	4,420	13,200	8,270	10,800	2,680	1,500
18	9,350	18,100	2,510	2,000		4,830	3,820	11,400	7,090	9,250	2,510	1,500
19	7,610	15,600	2,350		5,200	4,620	14,200	11,100	6,630	8,510	2,050	1,380
20	6,550	8,750	2,350		5,900	4,220	23,600	9,770	9,000	6,860	2,050	1,270
21	5,170	6,400	2,350		5,000	4,020	30,900	8,030	13,200	6,170	2,050	1,170
22	4,090	5,260	2,350		4,600	3,820	28,600	6,400	14,800	5,040	1,900	1,170
23	3,470	5,040	2,350		4,200	3 820	21,600	5,940	17,200	4,620	1,630	1,270
24	3,470	3,820	2,350		4,830	3,820	16,200	5,710	21,200	4,620	1,630	1,270
25	2,890	3,420	2,350		8,750	3,420	14,200	6,630	19,000	4,620	1,630	1,380
26	2,710	3,420	2,200	1,800	10,300	3,420	12,600	6,400	16,200	4,620	1,900	1,380
27	2,350	3,220	2,200		9,510	3,420	9,250	6,170	10,800	4,220	2,050	1,270
28	2,350	3,220	2,200		7,790	3,220	7,550	5,480	9,000	3,820	1,630	1,170
29	2,000	3,220	2,200			3,220	6,630	5,040	7,320	3,620	2,050	1,170
30	1,840	3,220	2,200			3,030	7,320	4,620	6,400	7,320	1,900	1,080
31	1,080		2,200			3,030		4,620		6,170	1,630	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	9,350	1,050	2,860	176,000
November	18,100	2,170	5,040	299,000
December	3,620	2,200	2,530	156,000
January			2,030	125,000
February			3,410	189,000
March	20,800	3,030	7,330	451,000
April	30,900	2,680	8,470	504,000
May	31,900	4,020	9,310	572,000
June	35,900	6,400	14,800	881,000
July	15,200	3,620	6,470	397,000
August	7,790	1,630	3,230	199,000
September	2,680	1,080	1,530	91,000
The year	35,900	1,050	5,580	4,040,000

Digitized by Google

KANSAS RIVER AT TOPEKA, KANS.

LOCATION.—Chain gage in Topeka, Shawnee County, 1½ miles above Soldier Creek.

DRAINAGE AREA.—56,400 square miles.

RECORDS AVAILABLE.—April to August, 1904; June, 1917, to September, 1929.

EXTREMES.—Maximum discharge during year, 68,300 second-feet Apr. 20 (gage height, 21.82 feet); minimum, 1,310 second-feet Sept. 30 (gage height, 3.0 feet).

1917–1929: Maximum discharge, 73,700 second-feet June 10, 1923; maximum gage height, that of Apr. 20, 1929; minimum discharge, 480 second-feet during January, 1925.

Maximum stage known, 32.7 feet May 30, 1903, from records of United States Weather Bureau.

REMARKS.—Records good except those for period of ice effect, Jan. 1 to Feb. 27, which are fair. Gage-height record furnished by United States Weather Bureau.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,890	2,190	4,440			11,700	5,470	8,830	15,400	7,330	7,960	1,980
2	1,890	2,500	4,440			9,270	4,270	7,750	36,200	6,280	8,170	1,840
3	1,750	3,710	4,440	2,600	2,200	9,930	4,270	6,910	34,600	5,870	7,120	1,840
4	1,750	3,530	4,070			10,400	4,270	6,490	34,600	5,270	6,070	1,840
5	1,620	5,010	3,890			13,400	3,700	6,070	24,800	5,070	5,270	1,980
6	1,620	4,820	3,530			19,500	3,320	5,670	18,200	4,870	4,470	1,980
7	1,620	4,630	3,350			17,600	2,960	5,670	15,000	5,070	4,080	1,700
8	1,620	4,440	3,180	2,500		22,300	2,960	5,470	18,500	5,070	3,700	1,700
9	1,490	4,440	3,010			15,000	2,960	5,070	14,200	4,470	3,510	1,700
10	1,490	4,440	3,010		2,000	11,500	5,670	4,870	11,300	4,270	3,890	1,700
11	1,490	4,250	3,010			10,200	5,870	5,870	10,800	4,670	3,890	2,780
12	1,360	4,250	3,010			7,960	4,270	10,400	11,500	5,070	3,890	2,960
13	1,360	4,070	3,180	3,000		7,960	3,510	31,900	17,600	5,470	5,270	1,980
14	1,360	3,710	4,250		1,980	8,390	3,320	31,900	15,700	15,000	5,470	1,980
15	1,360	3,350	4,630			8,170	3,320	24,800	15,400	13,900	4,470	1,980
16	1,360	3,530	4,630		1,980	7,330	3,320	19,500	13,400	14,800	3,700	1,980
17	3,530	8,570	3,530		4,080	6,490	4,670	16,600	11,300	14,200	3,510	1,840
18	7,770	34,600	3,530	2,500	5,270	5,470	5,070	14,800	8,610	11,000	3,140	1,700
19	7,170	23,400	3,350		5,670	5,270	4,270	13,900	8,170	9,270	2,780	1,840
20	6,770	17,700	3,530		6,280	5,070	66,900	12,400	7,750	8,830	2,270	1,840
21	5,970	9,590	3,350		6,910	4,670	46,900	11,300	12,490	8,170	2,270	1,700
22	5,200	7,170	3,180		5,270	4,270	39,800	9,050	17,600	5,870	2,270	1,700
23	4,070	5,970	3,010		4,870	4,270	29,300	7,750	26,700	5,270	2,270	1,570
24	3,530	5,200	3,010		5,470	4,670	21,500	7,120	21,900	5,070	1,980	1,570
25	3,180	4,630	2,840		7,960	4,270	16,900	6,910	23,000	5,270	1,980	1,570
26	3,010	4,630	2,840	2,200	10,200	3,890	14,800	6,700	20,200	5,270	2,120	1,570
27	2,500	3,890	3,010		12,400	3,700	12,900	6,700	16,300	4,870	2,120	1,570
28	2,190	4,070	3,010		10,400	3,700	9,710	6,910	11,700	4,470	2,120	1,570
29	2,040	4,070	3,180		-------	3,510	8,170	6,280	9,490	4,080	1,980	1,440
30	2,040	4,250	3,010		-------	3,510	7,330	7,120	7,960	3,980	1,980	1,310
31	2,040	-------	2,840		-------	4,270	-------	7,750	-------	7,330	1,980	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	7,770	1,360	2,780	171,000
November	34,600	2,190	6,690	398,000
December	4,630	2,840	3,460	213,000
January	-------	-------	2,490	153,000
February	-------	-------	4,200	233,000
March	22,300	3,510	8,310	511,000
April	66,900	2,960	11,700	696,000
May	31,900	4,870	10,600	652,000
June	36,200	7,750	17,000	1,010,000
July	15,000	3,890	6,950	427,000
August	8,170	1,980	3,730	229,000
September	2,960	1,310	1,820	108,000
The year	66,900	1,310	6,630	4,800,000

Digitized by Google

KANSAS RIVER AT BONNER SPRINGS, KANS.

LOCATION.—Chain gage in NW. ¼ sec. 32, T. 11 S., R. 23 E., at Bonner Springs, half a mile below Wolf Creek.

DRAINAGE AREA.—59,600 square miles.

RECORDS AVAILABLE.—July, 1917, to September, 1929.

EXTREMES.—Maximum discharge during year, 110,000 second-feet Apr. 21 (gage height, 22.2 feet); minimum, 1,630 second-feet Sept. 28–30 (gage height, 3.5 feet).

1917–1929: Maximum discharge, that of Apr. 21, 1929; maximum stage, 22.2 feet Mar. 17, 1919, and Apr. 21, 1929; minimum discharge, less than 650 second-feet during January, 1925.

REMARKS.—Records good except those for period of ice effect, Jan. 4 to Feb. 25, which are fair. Discharge estimated Nov. 16, May 22, 23, and June 30 Slight regulation caused by operation of power plant at Lawrence.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,710	3,220	6,880	4,500	2,700	18,700	9,550	9,050	24,400	7,730	6,300	2,130
2	2,540	3,980	7,120	3,770	2,700	15,200	8,320	10,100	50,700	7,250	6,770	2,130
3	2,540	4,080	6,410	3,080	2,650	10,600	6,880	9,050	69,600	6,770	6,530	2,000
4	2,450	5,490	5,840	2,800	2,600	10,900	5,260	8,560	52,800	6,530	5,610	2,000
5	2,450	4,930	5,720	2,650	2,550	11,200	4,610	8,080	44,800	5,840	4,940	1,870
6	2,450	4,930	5,260	2,480	2,550	20,800	4,190	7,840	25,400	5,610	4,500	1,870
7	2,450	4,930	4,930	2,650	2,500	21,000	3,980	7,600	17,800	7,490	4,080	1,750
8	2,370	4,930	4,820	2,800	2,450	20,600	3,980	7,360	22,500	6,530	3,670	1,870
9	2,370	4,610	4,720	3,250	2,400	21,000	5,840	7,120	21,500	5,610	3,670	1,750
10	2,290	4,720	4,720	3,500	2,450	12,200	6,180	6,640	15,300	5,380	3,670	1,750
11	2,290	4,720	4,400	3,500	2,500	9,800	7,600	9,300	11,500	5,160	3,670	1,750
12	2,290	4,610	4,300	3,400	2,500	9,550	8,320	31,200	11,200	5,380	3,470	2,000
13	2,290	4,400	4,400	3,300	2,550	10,100	5,950	31,200	14,500	6,530	3,470	2,270
14	2,220	4,190	6,410	3,200	2,600	10,300	4,930	38,100	16,100	6,770	4,290	2,000
15	2,220	4,080	6,640	3,100	2,610	9,550	5,490	29,500	14,500	12,400	4,500	1,870
16	2,450	26,600	6,880	3,100	2,800	8,560	7,360	22,500	13,100	12,100	4,080	2,000
17	2,540	49,400	7,840	3,100	3,570	7,840	6,410	19,200	11,500	12,800	3,470	1,750
18	4,080	60,200	6,880	3,100	7,360	6,880	5,950	17,800	9,710	11,000	3,100	1,750
19	7,120	52,800	5,950	3,100	6,880	6,410	6,410	16,100	9,710	9,210	3,100	1,870
20	7,120	32,900	5,260	3,000	8,080	6,180	52,800	13,400	10,700	8,210	2,750	1,750
21	6,410	22,500	5,040	2,900	6,880	5,950	106,000	12,400	16,100	7,730	2,580	1,750
22	6,180	11,800	4,820	2,750	5,700	5,490	103,000	11,100	15,300	6,300	2,580	1,750
23	5,380	9,050	4,720	2,780	5,040	5,260	64,100	9,800	35,200	5,610	2,270	1,870
24	4,300	8,320	4,610	2,800	4,400	4,930	35,700	8,460	42,400	4,940	2,270	1,630
25	3,980	7,360	4,500	2,800	7,600	4,720	32,900	7,970	37,500	4,940	2,270	1,630
26	3,770	6,640	4,400	2,850	32,300	4,610	23,400	7,970	22,900	4,940	2,420	1,750
27	3,570	6,410	4,300	2,900	28,400	4,400	17,300	7,970	19,200	4,720	2,270	1,750
28	3,280	5,950	4,300	2,850	26,900	4,300	14,400	7,730	14,500	4,500	2,270	1,630
29	2,990	5,720	4,190	2,800	.....	4,080	12,500	7,490	11,200	4,500	2,270	1,630
30	2,710	6,640	4,300	2,800	.....	3,980	10,100	7,250	9,460	4,080	2,270	1,630
31	2,450	.....	4,400	2,750	.....	7,840	.....	8,710	.....	3,870	2,130	.....

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	7,120	2,220	3,370	207,000
November	60,200	3,220	12,700	756,000
December	7,840	4,190	5,320	327,000
January	4,500	2,480	3,050	188,000
February	32,300	2,400	6,580	365,000
March	21,000	3,980	9,770	601,000
April	106,000	3,980	19,600	1,170,000
May	38,100	6,640	13,100	806,000
June	69,600	9,460	23,000	1,370,000
July	12,800	3,870	6,790	418,000
August	6,770	2,130	3,590	221,000
September	2,270	1,630	1,840	109,000
The year	106,000	1,630	9,030	6,540,000

Digitized by Google

FRENCHMAN CREEK NEAR HAMLET, NEBR.

LOCATION.—Staff gage in sec. 19, T. 5 N., R. 34 W., 1 mile east of Hamlet. Zero of gage is 2,798.43 feet above mean sea level.
DRAINAGE AREA.—1,420 square miles.
RECORDS AVAILABLE.—April to September, 1929.
EXTREMES.—Maximum discharge during period, 598 second-feet June 6 (gage height, 6.0 feet); minimum, 60 second-feet Aug. 5 (gage height, 1.20 feet). Maximum stage known, 9.1 feet about Aug. 3, 1928.
REMARKS.—Records good. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	122	91	73	66	72	16	95	105	101	66	75	85
2	------	113	92	76	66	66	17	98	104	101	66	73	81
3	------	110	92	73	67	66	18	107	100	95	74	74	86
4	------	113	98	72	71	76	19	106	99	93	69	73	88
5	------	117	91	74	63	82	20	115	90	88	64	69	85
6	------	139	271	78	67	84	21	120	92	87	64	66	86
7	------	130	220	74	75	90	22	117	96	87	64	64	89
8	------	132	180	75	73	94	23	110	98	86	81	65	89
9	------	126	155	75	73	95	24	509	97	84	81	66	85
10	------	125	137	73	76	93	25	312	96	87	81	66	86
11	------	122	136	69	69	97	26	184	91	89	82	66	88
12	89	119	124	73	75	98	27	157	89	94	81	68	86
13	87	115	110	68	70	96	28	139	93	98	70	66	86
14	88	112	101	67	69	93	29	131	97	86	71	67	86
15	89	110	101	66	74	88	30	125	100	81	73	67	86
							31	------	90	------	67	69	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 12-30	509	87	146	5,500
May	139	89	108	6,640
June	271	81	112	6,660
July	82	64	72.3	4,450
August	76	63	69.3	4,260
September	98	66	86.1	5,120
The period				32,600

Digitized by Google

SAPPA CREEK NEAR OBERLIN, KANS.

LOCATION.—Staff gage in NW. ¼ sec. 6, T. 3 S., R. 29 W., 1½ miles east of Oberlin.
DRAINAGE AREA.—1,050 square miles.
RECORDS AVAILABLE.—March to September, 1929.
EXTREMES.—Maximum discharge during period, 578 second-feet May 29 (gage height, 9.20 feet); minimum, 0.1 second-foot Sept. 17, 18, and 25–27 (gage height, 0.5 foot).
REMARKS.—Records fair.

Daily and monthly discharge, in second-feet, 1929

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1		3	5	42	6	12	0.5
2		3	5	24	8	11	1
3		3	4	22	4	7	.5
4		3	5	17	4	5	.5
5		3	5	22	3	4	.4
6		2	6	194	3	4	1
7		2	6	386	2	3	2
8		2	6	84	2	3	3
9		2	6	24	2	2	.5
10		2	5	39	2	2	.4
11		2	5	89	2	2	.4
12		2	4	28	2	2	.3
13		2	4	22	2	1	.2
14		2	4	17	2	1	.2
15		2	4	14	1	1	.2
16		2	4	12	1	1	.2
17		2	3	10	2	1	.1
18	3	3	3	8	2	1	.1
19	3	5	3	8	2	1	.2
20	3	6	3	7	2	1	.2
21	3	8	3	6	2	1	.3
22	3	6	3	6	2	1	.3
23	3	6	3	6	3	1	.2
24	3	6	3	8	71	.5	.2
25	3	6	2	8	5	.5	.1
26	3	6	2	8	131	1	.1
27	3	5	2	7	75	1	.1
28	3	5	2	7	42	.5	.2
29	2	4	534	6	28	.5	.3
30	3	4	326	5	14	.5	.2
31	3		42		13	.4	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March 18–31	3	2	2.93	81
April	8	2	3.63	216
May	534	2	32.6	2,000
June	386	5	37.9	2,260
July	131	1	14.2	873
August	12	.4	2.35	144
September	3	.1	.46	27
The period				5,600

Digitized by Google

BEAVER CREEK AT LUDELL, KANS.

LOCATION.—Staff gage in SW. ¼ sec. 30, T. 2 S., R. 32 W., at Chicago, Burlington & Quincy Railroad bridge at Ludell, 6 miles below mouth of Little Beaver Creek.

DRAINAGE AREA.—1,460 square miles.

RECORDS AVAILABLE.—March to September, 1929.

EXTREMES.—Maximum discharge during period, 146 second-feet July 23 (gage height, 7.53 feet); minimum, less than 1 second-foot during August.

REMARKS.—Records fair.

Daily and monthly discharge, in second-feet, 1929

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1		11	12	51	5	2	1
2		12	13	29	5	2	1
3		12	13	24	5	2	1
4		11	12	21	5		1
5		11	14	21	4		1
6		11	21	53	5		1
7		10	21	75	4	2	1
8		7	21	43	4		1
9		10	19	31	4		1
10		11	19	22	4		1
11		10	15	17	4		1
12		11	12	17	4		1
13		11	11	17	4		1
14		12	11	14	4		1
15		10	9	12	4	1	1
16		10	8	12	4		1
17		10	8	11	4		1
18	6	10	6	9	4		1
19	5	9	6	8	4	1	1
20	4	15	6	8	4	1	1
21	5	22	6	8	4	1	1
22	4	22	5	8	4	2	1
23	5	15	5	7	94	1	1
24	5	24	5	7	26	1	1
25	5	16	5	6	6	1	1
26	5	18	6	7	4	1	1
27	8	16	7	6	3	1	1
28	11	15	3	6	2	1	1
29	11	14	29	6	2	1	1
30	11	13	73	5	2	1	1
31	11		69		2	1	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March 18-31	11	4	6.86	190
April	24	7	13.0	774
May	73	3	15.2	935
June	75	5	18.7	1,110
July	94	2	7.55	464
August	2		1.35	83
September	1	1	1.00	60
The period				3,620

Digitized by Google

PRAIRIE DOG CREEK NEAR WOODRUFF, KANS.

LOCATION.—Chain gage in NW. ¼ sec. 9, T. 1 S., R. 19 W., 3 miles west of Woodruff.
DRAINAGE AREA.—900 square miles.
RECORDS AVAILABLE.—March to September, 1929.
EXTREMES.—Maximum discharge during period, about 2,830 second-feet July 25 (gage height, 25.02 feet); minimum, 4 second-feet Sept. 26–30.
REMARKS.—Records fair.

Daily and monthly discharge, in second-feet, 1929

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1		15	18	180	21	76	14
2		15	18	115	20	71	12
3		15	17	73	19	64	11
4		15	18	53	19	61	9
5		15	19	45	18	56	19
6		15	20	39	18	48	24
7		15	23	201	18	44	14
8		15	21	838	19	44	36
9		15	20	260	19	42	54
10		16	21	120	19	42	44
11		16	23	69	19	42	28
12		15	31	53	18	42	20
13		16	21	89	18	40	13
14		18	18	140	18	36	10
15		17	18	65	17	32	9
16		17	18	47	17	32	8
17		16	17	34	16	32	9
18		17	17	31	16	28	9
19	14	26	17	26	125	26	8
20	14	41	17	25	73	24	7
21	14	65	17	24	51	22	7
22	14	34	18	25	25	22	6
23	14	23	19	24	19	20	6
24	14	21	18	23	1,210	20	5
25	14	21	17	23	2,560	19	5
26	31	22	17	23	1,750	24	4
27	16	20	17	22	187	38	4
28	15	18	17	22	134	24	4
29	14	19	17	22	110	19	4
30	14	19	17	21	92	18	4
31	15		461		81	16	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March 19–31	31	14	15.6	402
April	65	15	20.4	1,210
May	461	17	33.1	2,040
June	838	21	91.1	5,420
July	2,560	16	218	13,400
August	76	16	36.3	2,230
September	54	4	13.6	809
The period				25,500

Digitized by Google

SMOKY HILL RIVER AT JEROME, KANS.

LOCATION.—Staff gage in NW. ¼ sec. 23, T. 15 S., R. 29 W., half a mile south of Jerome and 5 miles above Plum Creek.
DRAINAGE AREA.—3,900 square miles.
RECORDS AVAILABLE.—August, 1928, to September, 1929.
EXTREMES.—Maximum discharge during year, 690 second-feet Sept. 9 (gage height, 5.10 feet); minimum, less than 1 second-foot during winter.
1928–29: Maximum and minimum discharge, same as given above.
REMARKS.—Records fair. Stage-discharge relation affected by ice Dec. 1 to Feb. 28.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2	6				18	13	19	71	6	3	2
2	2	6				11	13	19	77	4	3	2
3	2	5	3			11	13	19	66	4	3	4
4	3	6				17	13	15	47	2	3	4
5	3	6				17	9	21	36	2	3	4
6	3	6				17	10	22	30	1	3	4
7	3	5				15	10	22	70	1	3	6
8	4	5				15	10	19	50	4	3	37
9	4	5				11	10	19	35	1	3	690
10	3	5				11	17	19	30	1	1	45
			2									
11	3	5				11	14	22	24	1	1	20
12	3	5				11	14	15	19	1	3	400
13	20	5				15	10	15	19	1	3	45
14	6	5				11	14	15	19	1	3	28
15	6	5				11	14	15	15	1	1	17
				1	1							
16	6	5				16	14	15	19	1	2	13
17	5	5				12	14	15	15	1	2	13
18	5	5				12	14	21	15	49	2	9
19	5	5				12	14	21	11	9	2	7
20	5	6				12	20	19	11	6	2	7
21	5	5				12	20	15	11	4	2	7
22	5	5				12	18	14	11	4	2	7
23	5	5				12	18	14	11	235	2	4
24	5	5	2			12	20	11	10	28	2	4
25	5	5				12	19	11	7	22	2	4
26	5	5				12	19	14	7	18	26	4
27	5	5				12	19	14	7	10	16	2
28	5	5				12	19	14	7	7	6	2
29	5	5				16	19	11	6	5	4	2
30	5	5				12	19	44	6	5	4	2
31	6	------			------	12	------	83	------	3	2	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	20	2	4.81	296
November	6	5	5.20	309
December	----------	----------	2.16	133
January	----------	----------	1.00	61
February	----------	----------	1.00	56
March	18	11	13.0	799
April	20	9	15.0	893
May	83	11	19.7	1,210
June	77	6	25.4	1,510
July	235	1	14.1	867
August	26	1	3.77	232
September	690	2	46.4	2,760
The year	690	----------	12.6	9,130

Digitized by Google

SMOKY HILL RIVER AT PFEIFER, KANS.

LOCATION.—Chain gage in SW. ¼ sec. 6, T. 15 S., R. 16 W., at highway bridge 1 mile east of Pfeifer.
DRAINAGE AREA.—6,070 square miles.
RECORDS AVAILABLE.—March to September, 1929.
EXTREMES.—Maximum discharge during period, 6,750 second-feet May 11 (gage height, 11.00 feet); minimum not determined.
REMARKS.—Records poor. Discharge estimated Mar. 30, 31, June 30, July 1, July 3 to Aug. 19, Aug. 22, and 24.

Daily and monthly discharge, in second-feet, 1929

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1		27	8	18	18		12
2		27	8	19	18		10
3		22	7	36			10
4		27	6	42			10
5		29	6	48		20	12
6		24	12	77	15		12
7		24	12	52			14
8		22	21	34			12
9		24	22	22			23
10		40	21	21			28
11		58	5,710	27			140
12		52	880	27			103
13		54	499	22	500		93
14		40	245	34			84
15		31	154	52		10	52
16	34	17	111	34			48
17	36	16	84	31			46
18	36	16	74	31	40		40
19	34	18	69	20			42
20	31	22	88	46		11	36
21	31	18	70	34		11	34
22	31	13	64	36		12	34
23	29	12	58	31		13	29
24	29	11	67	27		12	24
25	29	14	64	29		12	27
26	27	14	64	29	30	12	28
27	29	14	58	22		12	22
28	27	13	60	22		12	33
29	31	13	64	21		12	33
30	30	16	40	20		12	23
31	29	------	40	------		12	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March 16-31	36	27	30.8	975
April	58	11	24.3	1,450
May	5,710	6	280	17,200
June	77	18	32.1	1,910
July	------	------	103	6,330
August	------	------	14.0	861
September	140	10	37.1	2,210
The period	5,710	------	78.4	30,900

Digitized by Google

SMOKY HILL RIVER AT ELLSWORTH, KANS.

LOCATION.—Chain gage in SE. ¼ sec. 20, T. 15 S., R. 8 W., in Ellsworth, 2 miles below Turkey Creek.

DRAINAGE AREA.—7,580 square miles.

RECORDS AVAILABLE.—April, 1895, to October, 1905; July, 1918, to September, 1925; August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 17,000 second-feet May 12 (gage height, 21.03 feet); minimum not determined.

1895–1905, 1918–1925, 1928–29: Maximum discharge, 21,000 second-feet July 5, 1895; minimum, 1.6 second-feet Oct. 9 and 10, 1922.

A stage of 25.0 feet was reached in August, 1927 (discharge, about 24,000 second-feet).

REMARKS.—Records good except those for periods of ice effect (Dec. 20–24 and Jan. 1 to Feb. 28) and those for May 13 to July 12, which are fair.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	96	133	96			195	71	68	580	71	256	71
2	96	142	90			172	71	65	320	65	162	71
3	96	133	90	65	58	142	71	65	1,160	65	152	68
4	96	124	90			110	71	71	269	65	142	65
5	90	124	90			103	71	68	209	62	124	65
6	90	110	84			103	71	68	282	62	124	65
7	90	103	84			96	71	68	410	59	116	68
8	90	103	78			96	71	65	410	59	116	68
9	90	103	84		55	96	71	65	320	65	124	71
10	90	103	90	75		90	71	68	294	65	1,620	71
11	90	96	90			90	71	7,980	244	2,920	380	71
12	84	96	90			90	71	13,300	219	8,100	162	71
13	103	96	90			90	71	6,050	195	2,980	133	96
14	103	103	90			90	71	2,340	184	960	116	172
15	103	103	90		65	84	71	1,160	162	580	110	103
16	103	103	90			84	71	760	142	380	96	232
17	103	110	90			78	71	580	133	294	90	116
18	96	133	90	70		78	71	475	133	1,990	90	90
19	96	124	90			78	71	380	124	1,880	84	96
20	96	116				74	78	335	124	880	84	90
21	96	103	80			78	78	335	116	1,570	78	84
22	96	103			55	78	78	320	110	685	74	84
23	96	96				78	78	294	103	510	78	74
24	96	96				74	71	256	142	380	78	71
25	90	96	78	60		74	68	232	110	365	78	110
26	90	90	78			74	65	219	96	320	74	133
27	90	90	78		62	74	71	195	90	380	71	116
28	90	90	78		74	74	71	184	84	320	71	110
29	90	96	78		-------	74	65	172	74	294	71	68
30	96	90	78		-------	74	68	162	74	269	90	65
31	103	-------	84		-------	74	-------	580	-------	232	78	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	103	84	94.6	5,820
November	142	90	107	6,370
December	96	78	85.1	5,230
January	----------	----------	67.5	4,150
February	----------	----------	59	3,280
March	195	74	92.4	5,680
April	78	65	71.3	4,240
May	13,300	65	1,190	73,200
June	1,160	74	230	13,700
July	8,100	59	869	53,400
August	1,620	71	165	10,100
September	232	65	91.2	5,430
The year	13,300	----------	264	191,000

Digitized by Google

SMOKY HILL RIVER NEAR MENTOR, KANS.

LOCATION.—Chain gage in SE. ¼ sec. 18, T. 15 S., R. 2 W., 1½ miles east of Mentor and 26 miles above Saline River.

DRAINAGE AREA.—8,210 square miles.

RECORDS AVAILABLE.—December, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, 7,050 second-feet May 15 (gage height, 25.44 feet); minimum, 64 second-feet Nov. 30 (gage height, 3.2 feet).

1923–1929: Maximum discharge, 7,450 second-feet Aug. 17, 1927 (gage height, 25.8 feet); minimum, 12 second-feet several days in August, 1926.

REMARKS.—Records fair. Stage-discharge relation affected by ice Jan. 1 to Mar. 6. Slight regulation caused by operation of milldam upstream. Gage-height record furnished by United States Weather Bureau.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	218	170	161	115	78	191	125	99	4,060	208	500	179
2	208	179	161	115	78	220	134	99	4,060	188	459	179
3	188	188	161	115	78	180	125	107	4,090	179	420	179
4	188	198	152	100	78	186	116	107	4,060	170	394	179
5	198	208	143	75	78	197	116	107	4,120	161	370	161
6	188	208	134	64	71	208	116	99	1,780	161	346	152
7	179	188	134	71	71	218	107	99	931	152	334	161
8	179	179	143	71	71	179	107	99	970	161	323	152
9	170	170	152	71	71	161	107	107	1,440	161	312	152
10	170	161	143	71	71	161	107	107	931	279	312	152
11	161	161	134	78	71	161	107	1,880	749	3,910	500	143
12	161	152	134	78	71	161	99	5,080	650	4,620	1,670	143
13	161	134	134	78	78	161	99	5,490	560	5,320	666	134
14	161	170	125	78	78	161	107	6,030	486	5,670	420	125
15	152	170	125	78	78	161	116	6,750	459	5,760	346	125
16	161	179	134	78	78	152	107	6,390	420	3,410	301	125
17	161	208	143	90	78	152	107	2,460	382	1,140	279	208
18	152	238	143	86	99	143	99	1,210	358	856	268	208
19	152	290	134	86	92	143	99	732	334	749	258	218
20	152	279	134	80	99	134	116	650	312	1,510	258	228
21	161	228	125	71	107	134	134	715	290	1,100	248	248
22	161	188	125	78	107	134	290	635	268	1,370	228	248
23	152	161	116	78	99	134	228	605	268	1,960	208	218
24	152	134	107	78	99	134	198	590	279	1,050	198	170
25	152	125	107	78	107	125	188	545	590	820	198	152
26	152	107	125	85	116	125	188	515	301	698	188	134
27	152	85	134	78	134	116	161	500	290	575	179	125
28	143	71	134	78	162	116	143	472	268	530	179	116
29	143	71	125	78	------	116	116	433	258	500	179	116
30	152	64	134	85	------	116	107	472	238	575	179	107
31	152	------	134	78	------	125	------	2,660	------	530	170	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	218	143	166	10,200
November	290	64	169	10,100
December	161	107	135	8,300
January	115	64	82.0	5,040
February	162	71	89.2	4,960
March	220	116	155	9,530
April	290	99	132	7,860
May	6,750	99	1,480	91,000
June	4,120	238	1,140	6,800
July	5,760	152	1,440	88,500
August	1,670	170	351	21,600
September	248	107	165	9,820
The year	6,750	64	462	335,000

Digitized by Google

SMOKY HILL RIVER AT SOLOMON, KANS.

LOCATION.—Chain gage in SE. ¼ sec. 19, T. 13 S., R. 1 E., 500 feet below Solomon River and 1 mile south of Solomon.

DRAINAGE AREA.—18,700 square miles.

RECORDS AVAILABLE.—April to July, 1904; October, 1922, to September, 1929.

EXTREMES.—Maximum discharge during year, 12,000 second-feet July 13 (gage height, 24.5 feet); minimum, about 210 second-feet in February.

1904, 1922–1929: Maximum discharge, 18,400 second-feet Aug. 10, 1928 (gage height, 28.0 feet); minimum, 25 second-feet Oct. 14, 1925.

Maximum stage during flood of 1903 was determined by levels to be about 35.0 feet.

REMARKS.—Records fair. Stage-discharge relation affected by ice Jan. 5 to Feb. 28. Regulation caused by operation of mills and power plants up stream. Gage-height record furnished by United States Weather Bureau.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	880	745	664	560	356	2,900	799	691	4,000	908	2,620	560
2	853	772	664	560	308	3,500	638	638	7,620	826	1,950	534
3	853	799	664	534	236	3,180	638	612	7,110	799	1,360	534
4	826	826	664	534	236	2,460	586	586	5,500	799	1,180	508
5	826	826	638	508	236	1,760	560	560	5,500	745	1,050	534
6	799	853	638	508	236	1,720	560	560	4,980	718	992	508
7	799	880	638	482	212	1,120	508	580	3,060	612	908	508
8	799	880	638	456	260	964	508	534	2,050	718	964	718
9	772	853	612	456	308	880	508	534	3,940	638	880	708
10	772	826	612	431	236	853	534	534	6,090	638	1,120	482
11	772	799	612	431	236	826	534	586	7,700	826	3,620	508
12	745	745	586	406	260	799	534	9,200	8,280	10,100	2,250	560
13	745	718	586	406	284	772	508	10,800	8,550	12,000	1,440	534
14	745	691	586	406	308	772	534	9,300	6,970	8,730	1,180	508
15	992	691	586	406	308	745	745	8,460	2,150	6,970	1,020	560
16	745	691	560	400	284	718	772	7,390	1,850	5,500	908	534
17	1,150	964	560	400	284	691	560	7,320	1,760	5,240	826	534
18	1,490	1,020	586	400	356	691	534	7,320	1,400	3,560	772	508
19	1,180	992	586	406	482	664	508	3,450	1,220	2,150	745	534
20	1,020	936	612	406	612	664	853	2,300	1,220	1,620	718	534
21	936	880	612	351	560	638	5,880	1,760	1,760	1,360	691	508
22	880	853	586	356	456	638	7,780	1,620	1,800	2,680	664	508
23	853	799	586	332	308	612	7,940	2,300	2,150	2,400	664	508
24	799	745	612	381	284	612	7,780	2,000	3,120	2,150	612	482
25	772	718	612	406	381	612	3,560	1,540	2,460	2,000	534	482
26	745	691	638	406	406	586	1,400	1,360	2,050	1,580	586	456
27	745	691	612	381	560	586	1,050	1,180	2,000	1,220	664	482
28	718	691	612	356	936	586	880	1,180	1,440	1,120	612	431
29	718	664	586	356	-------	586	799	1,080	1,120	1,180	612	406
30	718	664	586	332	-------	586	745	992	992	3,620	560	406
31	718	-------	586	356	-------	612	-------	1,120	-------	3,120	560	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,490	718	850	52,300
November	1,020	664	797	47,400
December	664	560	610	37,500
January	560	332	424	26,100
February	936	212	355	19,700
March	3,500	586	1,080	66,400
April	7,940	508	1,660	98,800
May	10,800	534	2,840	175,000
June	8,550	992	3,680	219,000
July	12,000	612	2,790	172,000
August	3,620	534	1,070	65,800
September	718	406	519	30,900
The year	12,000	212	1,400	1,010,000

Digitized by Google

SALINE RIVER NEAR WILSON, KANS.

LOCATION.—Chain gage in SW. ¼ sec. 11, T. 13 S., R. 11 W., three-fourths mile above Hell Creek and 8 miles northwest of Wilson.
DRAINAGE AREA.—1,900 square miles.
RECORDS AVAILABLE.—May to September, 1929.
EXTREMES.—Maximum discharge during period, 3,150 second-feet July 27 (gage height, 12.0 feet); minimum, 5 second-feet July 9 (gage height, 2.45 feet).
REMARKS.—Records fair.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1	-------	75	14	200	41	16	120	39	624	80	46
2	-------	71	13	178	37	17	111	35	560	77	42
3	-------	63	11	158	33	18	101	32	1,360	73	39
4	-------	56	9	138	30	19	94	28	1,210	65	42
5	-------	50	10	128	27	20	80	26	1,170	58	39
6	-------	67	9	122	21	21	138	41	791	54	35
7	-------	82	8	115	24	22	158	39	138	46	32
8	-------	178	6	107	27	23	138	65	115	77	35
9	-------	148	5	96	88	24	120	54	100	58	39
10	-------	138	6	118	80	25	111	46	222	27	32
11	1,070	98	7	111	67	26	94	44	1,280	82	46
12	1,030	62	24	103	60	27	88	41	2,910	75	46
13	257	56	50	103	56	28	80	37	496	67	39
14	178	56	859	100	52	29	73	33	354	60	42
15	148	46	791	92	52	30	69	28	268	52	39
						31	75	-------	234	44	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 11–31	1,070	69	206	8,580
June	178	26	61.1	3,640
July	2,910	5	440	27,100
August	200	27	92.4	5,680
September	88	21	42.9	2,550
The period	-------	-------	-------	47,600

Digitized by Google

SALINE RIVER AT TESCOTT, KANS.

LOCATION.—Chain gage in SE. ¼ sec. 16, T. 12 S., R. 5 W., half a mile south of Tescott and half a mile above Dry Creek.

DRAINAGE AREA.—2,800 square miles.

RECORDS AVAILABLE.—September, 1919, to September, 1929.

EXTREMES.—Maximum discharge during year, 1,550 second-feet May 14 (gage height, 17.50 feet); minimum, 54 second-feet Sept. 30 (gage height, 4.58 feet).

1919–1929: Maximum discharge, 6,150 second-feet July 12, 1928 (gage height, 29.48 feet); minimum, 0.5 second-foot July 8, 1926.

REMARKS.—Records fair except those for period of ice effect, Jan. 15 to Mar. 2, which are poor. Discharge estimated Mar. 13, 24, Apr. 4, 25–27, Aug. 12–17, 20, 21, and Sept. 7. Regulation caused by operation of mills upstream.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	155	143	143	149		201	131	100	173	85	260	73
2	161	137	131	143		243	131	95	755	73	215	73
3	149	143	143	143		284	137	90	428	81	187	66
4	155	143	149	149		222	134	90	201	66	173	66
5	161	137	143			201	131	81	155	69	155	63
6	143	143	149			149	131	95	155	60	143	66
7	131	149	131			143	125	95	149	115	143	66
8	131	143	143			137	131	95	293	57	125	66
9	131	137	149			131	131	95	902	63	125	66
10	143	137	149			125	125	100	505	69	131	66
11	143	143	143			131	131	236	284	81	125	69
12	149	155	137			120	131	1,350	229	66	120	69
13	143	143	131			120	137	1,290	229	66	115	105
14	143	155	143		75	120	125	1,530	244	77	109	77
15	143	155	149			131	137	902	194	392	103	77
16	143	143	149			125	155	392	131	455	97	69
17	143	143	149			143	161	268	115	222	91	85
18	131	137	143	110		137	187	208	105	161	85	69
19	143	143	143			143	208	194	100	110	85	85
20	149	131	149			131	338	167	90	244	80	66
21	143	131	155			143	236	155	100	634	75	66
22	137	131	155			125	208	155	131	401	69	69
23	131	143	137			131	194	180	143	201	69	63
24	143	149	149			121	180	194	100	155	77	63
25	155	155	143			131	158	208	110	120	77	73
26	155	155	143			143	137	178	105	120	77	60
27	149	149	155		117	131	116	155	105	105	77	66
28	149	143	143		159	131	95	143	90	535	73	69
29	143	155	143		-------	131	95	131	77	1,030	77	66
30	143	143	149		-------	143	110	125	66	809	77	54
31	137	-------	149		-------	143	-------	120	-------	410	73	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	161	131	144	8,550
November	155	131	144	8,570
December	155	131	145	8,920
January	149	110	115	7,070
February	159	75	79.5	4,420
March	284	120	149	9,160
April	338	95	152	9,040
May	1,530	81	297	18,300
June	902	66	215	12,800
July	1,030	57	230	14,100
August	260	69	113	6,950
September	105	54	69.7	4,150
The year	1,530	54	155	112,000

Digitized by Google

SOUTH FORK OF SOLOMON RIVER AT ALTON, KANS.

LOCATION.—Chain gage in SW. ¼ sec. 12, T. 7 S., R. 15 W., three-fourths mile south of Alton.

DRAINAGE AREA.—1,720 square miles.

RECORDS AVAILABLE.—August, 1919, to June, 1925; August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 1,510 second-feet July 25 (gage height, 10.23 feet); minimum, 10 second-feet July 21–23 (gage height, 1.9 feet).

1919–1925, 1928–29: Maximum discharge, 9,340 second-feet Sept. 19, 1919 (gage height, 19.5 feet); minimum, 0.1 second-foot Sept. 7 and 27, 1922. Maximum stage known, 24.5 feet Aug. 1, 1928.

REMARKS.—Records fair. Stage-discharge relation affected by ice Jan. 6 to Mar. 5. Discharge estimated Mar. 3, 19, 21–23, Sept. 29, and 30. Slight regulation caused by operations at small dam upstream.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	110	118	81	37	33	45	49	52	57	22	103	20
2	110	118	78	40	43	50	50	50	55	20	96	18
3	110	125	76	44	57	62	52	48	52	19	89	18
4	103	125	65	42	55	74	49	50	48	16	82	18
5	103	125	60	50	52	110	52	52	45	16	78	19
6	103	110	60	35	55	156	54	56	46	15	74	19
7	103	110	77	18	59	148	50	57	452	14	70	21
8	103	103	89	26	42	51	50	59	325	20	66	20
9	89	103	82	26	38	103	49	62	180	21	64	34
10	74	96	794	28	43	96	51	60	132	19	64	45
11	70	96	103	30	44	89	54	57	103	17	118	61
12	82	96	96	31	45	81	56	60	89	14	132	55
13	433	96	89	36	45	79	55	61	72	14	96	52
14	271	89	82	45	50	74	51	57	64	14	70	42
15	237	82	78	40	48	65	49	60	66	13	57	33
16	204	89	72	36	51	62	46	62	64	12	52	24
17	188	89	68	28	48	62	51	62	54	10	49	20
18	164	96	60	38	50	62	132	103	62	12	41	18
19	148	96	52	41	51	61	118	379	82	12	39	17
20	62	89	50	26	57	60	96	433	50	12	40	15
21	132	89	48	18	60	60	76	433	42	10	42	14
22	110	82	57	20	57	59	77	361	36	10	36	12
23	118	82	60	22	55	58	79	271	34	10	36	11
24	110	82	54	24	43	57	74	254	26	57	36	12
25	103	82	60	26	49	54	66	140	42	1,370	32	12
26	96	82	82	28	43	55	66	110	35	623	44	11
27	103	82	82	30	32	54	66	81	32	452	36	12
28	103	82	78	32	45	54	61	61	29	196	34	13
29	103	89	74	31	------	55	55	57	25	172	32	13
30	96	89	73	33	------	55	56	57	22	148	28	14
31	103	------	70	32	------	52	------	55	------	118	26	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	433	62	130	8,000
November	125	82	96.4	5,740
December	794	48	95.2	5,850
January	50	18	32.0	1,970
February	60	32	48.2	2,680
March	156	45	71.1	4,370
April	132	46	63.0	3,750
May	433	48	121	7,440
June	452	22	80.7	4,800
July	1,370	10	112	6,890
August	132	26	60.1	3,700
September	61	11	23.4	1,390
The year	1,370	10	78.2	56,600

Digitized by Google

SOLOMON RIVER AT BELOIT, KANS.

LOCATION.—Chain gage in SW. ¼ sec. 9, T. 7 S., R. 7 W., at highway bridge in Beloit, 93 miles above junction with Smoky Hill River at Solomon, Kans.

DRAINAGE AREA.—5,410 square miles.

RECORDS AVAILABLE.—April to September, 1929.

EXTREMES.—Maximum discharge during period, 11,900 second-feet June 8 (gage height, 26.40 feet); minimum, 5 second-feet occurs during low-water periods when power plant upstream is closed down.

REMARKS.—Records fair except those for August and September, which are poor. Discharge estimated Apr. 14, June 22, July 4, 10, 16, Aug. 20, 25, 29, and Sept. 1–30. Considerable regulation caused by operation of power plant 200 feet above gage.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	-------	174	430	144	390	102	16	124	207	302	100	144	144
2	-------	164	174	164	338	106	17	144	174	326	124	134	124
3	-------	207	164	144	326	102	18	134	254	278	88	71	115
4	-------	144	302	100	266	106	19	1,210	278	254	97	124	106
5	-------	144	218	106	254	106	20	7,160	1,040	690	314	88	106
6	-------	185	230	134	242	106	21	6,350	706	2,130	144	134	102
7	-------	154	5,520	124	196	124	22	934	338	458	144	102	102
8	-------	144	11,900	115	218	124	23	458	254	351	102	84	124
9	-------	144	10,900	115	207	124	24	326	218	754	97	144	144
10	-------	154	2,200	100	196	124	25	254	185	528	124	144	124
11	-------	278	722	326	134	185	26	230	144	364	858	154	106
12	-------	1,770	542	338	185	144	27	207	154	230	5,320	124	106
13	-------	858	658	196	174	207	28	185	144	207	1,530	115	106
14	124	403	500	154	218	174	29	207	124	185	690	154	196
15	154	278	338	115	196	164	30	185	134	164	542	115	97
							31	-------	144	-------	458	134	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 14–30	7,160	124	1,080	36,400
May	1,770	124	313	19,200
June	11,900	164	1,400	83,300
July	5,320	88	423	26,000
August	390	71	178	10,900
September	207	97	124	7,380
The period	-------	-------	-------	183,000

Digitized by Google

SOLOMON RIVER AT NILES, KANS.

LOCATION.—Chain gage in NW. ¼ sec. 31, T. 12 S., R. 1 W., three-fourths mile west of Niles and 7 miles above mouth of river.

DRAINAGE AREA.—6,710 square miles.

RECORDS AVAILABLE.—May, 1897, to November, 1903; May, 1919, to September, 1929.

EXTREMES.—Maximum discharge during year, 8,860 second-feet June 12 (gage height, 26.67 feet); minimum, 105 second-feet Sept. 30 (gage height, 3.88 feet).

1897–1903, 1919–1929: Maximum discharge, 10,600 second-feet June 3, 1903 (gage height, 33.8 feet, old datum); minimum, 1 second-foot Sept. 4, 1926.

REMARKS.—Records good except those for period of ice effect, Jan. 1 to Feb. 28, and those for Mar. 3 to Apr. 19, which are fair. Flow is regulated by operation of power plants upstream.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	309	322	270			1,360	188	391	1,270	405	625	168
2	309	363	270			1,400	210	363	1,740	363	512	178
3	309	377	270	160		958	199	335	864	349	435	178
4	309	420	270			676	210	322	592	335	391	178
5	296	349	270			512	234	309	450	296	363	168
6	283	363	258		140	480	199	322	420	296	349	168
7	296	405	246			420	188	309	450	283	335	178
8	270	420	258			363	188	309	1,500	283	322	158
9	283	363	258			349	246	309	5,760	270	296	130
10	283	349	210			363	258	309	7,080	283	1,360	168
11	283	322	222	170		349	210	576	8,050	1,360	576	234
12	283	296	234			349	178	1,400	8,750	3,900	309	210
13	270	309	234		130	349	210	1,600	7,400	1,630	296	199
14	283	309	258			335	222	1,670	1,630	608	296	188
15	270	296	270			309	258	1,500	901	465	283	188
16	560	309	258			296	199	761	920	377	270	199
17	1,270	270	258			283	178	544	710	335	258	222
18	864	246	270			258	199	450	592	309	296	199
19	608	335	270			270	188	391	560	270	270	188
20	512	349	270			258	4,850	363	864	246	246	178
21	450	322	258	160	170	270	6,650	450	978	222	234	158
22	377	309	246			246	6,650	920	1,460	222	246	158
23	363	296	222			258	7,450	1,170	2,220	270	222	148
24	335	283	222			246	4,950	676	2,090	309	188	158
25	335	283	322			210	1,240	480	1,110	270	199	148
26	309	270	222		258	234	778	420	1,330	246	222	168
27	309	270	222		480	234	608	377	958	234	199	139
28	309	270	246	140	700	222	512	349	693	234	210	130
29	270	270	222		-------	234	465	309	544	2,740	199	139
30	296	283	234		-------	210	420	296	450	2,610	199	105
31	296	-------	234		-------	234	-------	322	-------	939	188	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,270	270	381	23,400
November	420	246	321	19,100
December	322	210	251	15,400
January	-------	-------	159	9,780
February	-------	-------	185	10,300
March	1,400	210	404	24,800
April	7,450	178	1,280	76,200
May	1,670	296	590	36,300
June	8,750	420	2,080	124,000
July	3,900	222	676	41,600
August	1,360	188	335	20,600
September	234	105	171	10,200
The year	8,750	105	569	412,000

Digitized by Google

NORTH FORK OF SOLOMON RIVER AT KIRWIN, KANS.

LOCATION.—Chain gage in SW. ¼ sec. 34, T. 4 S., R. 16 W., half a mile south of Kirwin and three-fourths mile below Bow Creek.

DRAINAGE AREA.—1,290 square miles.

RECORDS AVAILABLE.—August, 1919, to June, 1925; August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 6,870 second-feet July 26 (gage height, 16.25 feet); minimum, 0.5 second-foot July 20.

1919–1925, 1928–29: Maximum discharge (estimated), 15,500 second-feet Sept. 18, 1919 (gage height, 22.5 feet); minimum, 0.5 second-foot Dec. 5, 1922, Oct. 1, 5, 12, and 19, 1924, and July 20, 1929.

REMARKS.—Records fair. Stage-discharge relation affected by ice Jan. 6 to Feb. 25. Flow is regulated by operation of milldam upstream.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	47	54	31	49		55	34	48	130	22	93	21
2	35	93	33	53		58	33	40	138	17	76	20
3	41	65	33	31		59	34	44	122	23	73	20
4	38	56	31	31		58	37	49	114	28	69	28
5	39	43	37	25	4	61	42	40	107	11	62	38
6	34	46	37			61	41	46	86	14	57	30
7	34	43	37			65	44	40	93	9	56	23
8	44	41	35	10		80	42	35	138	34	60	16
9	36	39	35			54	37	51	138	20	56	30
10	36	48	35			65	37	66	107	8	57	27
11	44	42	39			53	37	122	93	27	55	28
12	535	41	57			55	42	86	80	52	48	28
13	535	42	59			59	35	86	66	10	51	27
14	343	39	45			41	36	74	47	9	43	21
15	202	42	38			43	35	57	50	12	48	12
16	122	38	48	6	5	53	45	66	54	11	41	20
17	93	41	50			35	43	68	64	5	51	18
18	75	32	28			36	53	73	44	10	47	20
19	66	46	43			46	93	69	56	5	37	20
20	59	36	23			31	74	58	41	12	42	20
21	59	39	38			35	61	56	58	26	35	12
22	61	37	46			39	80	60	46	18	42	6
23	57	35	38		6	33	49	53	64	36	31	17
24	52	37	36			38	36	48	34	437	28	8
25	53	33	41	4		44	8	62	31	5,180	29	14
26	53	38	26		10	32	41	54	34	6,390	29	14
27	42	36	51		16	33	42	45	17	277	26	14
28	42	42	44		35	39	47	45	23	182	26	4
29	47	42	45		------	33	44	51	20	130	26	5
30	47	36	50		------	36	47	41	30	107	25	12
31	43	------	50	------	------	32	------	57	------	86	31	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	535	34	97.2	5,980
November	93	32	43.4	2,580
December	59	23	40.0	2,460
January	49	----------	11.1	682
February	35	----------	6.46	359
March	80	31	47.2	2,900
April	93	8	44.3	2,640
May	122	35	57.7	3,550
June	138	17	70.8	4,210
July	6,390	5	42.6	26,200
August	93	25	46.8	2,880
September	38	4	19.1	1,140
The year	6,390	4	76.8	55,600

Digitized by Google

BIG BLUE RIVER AT HULL, KANS.

LOCATION.—Chain gage in NW. ¼ sec. 3, T. 2 S., R. 7 E., one-fourth mile west of Hull and 2 miles above Deer Creek.

DRAINAGE AREA.—4,510 square miles.

RECORDS AVAILABLE.—August, 1919, to July, 1925; August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 8,980 second-feet June 2 (gage height, 16.00 feet); minimum, 59 second-feet Oct. 2 (gage height, 2.40 feet).

1919–1925, 1928–29: Maximum discharge, 14,500 second-feet Oct. 3, 1923 (gage height, 20.8 feet); minimum, 2 second-feet Sept. 8 and 14, 1922 (gage height, 1.20 feet).

Maximum stage known, 31.7 feet in May, 1903.

REMARKS.—Records fair except those for estimated periods, which are poor. Flow regulated by operation of power plants upstream.

Daily and monthly discharge, in second-feet, 1928–29.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1	157	632				595	365	396	6,170	365		166
2	115	985				559	268	365	6,080	320		186
3	166	1,300			e 230	1,070	219	280	3,500	292		197
4	139	1,250				2,790	208	186	1,700	268		139
5	176	1,250				3,960	197	197	1,030	320		90
6	219	1,300		e 210		e 7,100	176	186	670	292		70
7	176	2,000				5,640	2,650	166	595	320		75
8	115	1,760				1,820	746	166	746	320	e 350	85
9	130	1,400				1,520	559	122	595	902		176
10	130	1,070			e 250	1,520	305	130	524	524		176
11	108	902				2,240	305	2,510	490	320		157
12	130	746				2,060	396	3,280	396	350		166
13	242	632				1,640	458	784	350	458		176
14	1,110	524				1,460	2,120	524	320	1,200		166
15	2,860	458	e 270	e 250		1,460	2,060	524	350	e 1,100		96
16	3,800	458			e 862	1,350	1,940	350	427	e 967	148	130
17	4,860	595			e 1,580	1,070	2,000	166	350	e 832	116	139
18	3,580	1,160			e 2,060	1,030	2,180	166	350	e 697	85	122
19	2,310	902			e 1,820	943	2,180	166	335	e 562	108	148
20	1,300	943			e 1,760	708	4,860	427	3,580	e 427	115	157
21	985	862			e 1,520	490	3,880	396	3,000	292	96	139
22	862	784			e 1,250	365	2,310	396	5,550	320	115	96
23	784	524			396	255	985	320	7,220	320	148	90
24	708	595			1,640	186	823	115	5,550	292	102	102
25	524	490		e 230	1,520	148	746	242	3,730	320	108	255
26	524	157			1,300	186	632	365	1,520	292	242	242
27	335	350			1,030	230	458	396	985	e 475	305	108
28	305	320			1,110	292	396	320	670		292	115
29	280	197			-------	396	350	335	524		122	75
30	280	e 320			-------	396	350	396	524		208	130
31	280	-------	-------	-------	-------	396	-------	784	-------	-------	157	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	4,860	108	893	54,900
November	2,000	157	829	49,300
December	-------	-------	270	16,600
January	-------	-------	230	14,100
February	2,060	-------	768	42,700
March	7,100	148	1,420	87,300
April	4,860	176	1,170	69,600
May	3,280	115	489	30,100
June	7,220	320	1,930	115,000
July	1,200	268	485	29,800
August	-------	96	249	15,300
September	255	70	139	8,270
The year	7,220	70	735	533,000

e Estimated because of ice or missing gage height.

Digitized by Google

BIG BLUE RIVER AT RANDOLPH, KANS.

LOCATION.—Chain gage in SW. ¼ sec. 12, T. 7 S., R. 6 E., at Randolph, half a mile above Fancy Creek.

DRAINAGE AREA.—8,860 square miles.

RECORDS AVAILABLE.—April, 1918, to September, 1929.

EXTREMES.—Maximum discharge during year, 22,600 second-feet June 1 (gage height, 22.38 feet); minimum, 228 second-feet Aug. 21 (gage height, 2.71 feet).

1918–1929: Maximum discharge, that of June 1, 1929; minimum, 175 second-feet Aug. 9, 1926 (gage height, 2.26 feet).

Maximum stage known, 31.7 feet May 31, 1903.

REMARKS.—Records good except those for period of ice effect, Jan. 6 to Feb. 28, which are fair. Discharge estimated Apr. 29 to May 1 Flow slightly affected by operation of power plants upstream.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	365	805	965	660	480	2,740	755	1,040	22,300	1,020	660	502
2	348	855	910	525	480	3,320	855	965	15,300	1,080	615	502
3	312	2,660	805	855	525	4,780	805	965	14,500	910	548	420
4	330	2,560	660	755	460	7,520	805	855	9,080	805	525	440
5	365	2,240	705	615	470	9,200	660	855	4,450	755	502	440
6	295	2,000	548	570	440	11,100	615	965	2,940	755	525	400
7	330	2,160	548	615	502	14,700	1,270	805	2,740	705	480	312
8	392	2,400	570	525	525	7,400	3,030	855	2,560	705	480	352
9	330	2,160	615	570	502	4,340	1,480	805	2,240	910	440	440
10	330	2,000	660	660	480	3,410	965	855	1,920	1,020	460	352
11	330	1,770	570	615	502	3,030	805	3,500	1,620	1,540	440	615
12	330	1,480	570	615	502	3,120	705	12,900	1,540	1,770	440	502
13	330	1,270	755	660	525	3,030	755	7,880	1,400	1,140	400	460
14	348	1,140	705	548	570	2,940	755	4,890	1,400	1,140	440	352
15	2,480	1,020	660	570	525	1,920	1,020	3,030	1,340	2,480	348	480
16	5,120	910	705	480	570	1,400	1,920	1,840	1,140	1,540	400	420
17	5,600	2,400	705	548	1,480	1,480	965	1,400	1,140	1,080	330	420
18	5,000	4,560	755	480	4,450	1,340	755	1,200	965	1,200	312	365
19	3,700	3,600	570	480	4,230	1,200	7,760	660	855	1,020	348	330
20	2,560	1,840	660	460	2,740	1,020	6,920	805	4,890	755	348	295
21	1,770	1,270	525	525	2,080	965	9,320	1,020	8,120	910	295	330
22	1,540	1,020	570	570	1,690	965	9,440	1,020	7,760	955	330	312
23	1,400	855	570	460	1,540	965	4,340	1,020	13,600	615	420	330
24	1,140	855	570	460	2,840	910	2,480	910	9,680	615	400	330
25	965	755	570	460	5,480	910	2,000	965	7,640	570	400	312
26	805	755	660	460	3,600	965	1,700	1,770	4,890	548	312	330
27	755	705	660	502	2,400	855	1,480	1,480	2,940	525	460	278
28	705	755	705	480	2,080	805	1,270	1,020	1,920	548	480	295
29	705	705	615	480	-------	805	1,190	965	1,480	910	400	312
30	705	755	570	460	-------	805	1,120	855	1,140	805	382	295
31	705	-------	615	480	-------	705	-------	1,340	--------	705	400	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	5,600	295	1,300	79,900
November	4,560	705	1,610	95,800
December	965	525	654	40,200
January	855	460	553	34,000
February	5,480	440	1,520	84,400
March	14,700	705	3,180	188,000
April	9,440	615	2,260	134,000
May	12,900	660	1,920	118,000
June	22,300	855	5,120	305,000
July	2,480	525	966	59,400
August	660	295	430	26,400
September	615	295	387	23,000
The year	22,300	295	1,650	1,190,000

Digitized by Google

LITTLE BLUE RIVER NEAR ENDICOTT, NEBR.

LOCATION.—Chain gage in sec. 5, T. 1 N., R. 3 E., 1½ miles southwest of Endicott.
DRAINAGE AREA.—2,590 square miles.
RECORDS AVAILABLE.—April to September, 1929.
EXTREMES.—Maximum discharge during period, 1,440 second-feet June 21 (gage height, 4.62 feet); minimum, 54 second-feet Aug. 10 (gage height, 0.21 foot).
REMARKS.—Records fair. No diversions. Diurnal fluctuations caused by operation of power dams above.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	-------	188	198	152	144	136	16	-------	170	120	136	80	112
2	-------	179	144	136	136	120	17	-------	170	128	144	83	112
3	-------	188	198	136	128	104	18	-------	161	120	170	93	112
4	-------	188	170	136	120	104	19	-------	136	112	128	67	112
5	-------	170	152	128	112	96	20	-------	152	435	120	85	96
6	-------	179	161	136	104	96	21	-------	152	1,030	120	93	112
7	-------	170	161	136	104	93	22	-------	152	830	112	78	112
8	-------	179	161	128	112	96	23	-------	144	605	112	75	112
9	-------	179	152	120	112	91	24	-------	136	500	104	91	104
10	-------	170	152	128	78	104	25	218	152	405	104	88	112
11	-------	338	152	136	112	104	26	179	152	291	104	90	112
12	-------	218	144	179	96	120	27	188	144	228	500	228	112
13	-------	170	128	144	96	104	28	188	144	188	270	112	104
14	-------	170	128	128	104	112	29	208	128	179	170	270	104
15	-------	161	128	112	93	112	30	188	152	152	170	248	112
							31	-------	136	-------	144	152	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 25–30	218	179	195	2,320
May	338	128	169	10,400
June	1,030	112	255	15,200
July	500	104	150	9,220
August	270	67	116	7,130
September	136	91	108	6,430
The period	-------	-------	-------	50,700

Digitized by Google

LITTLE BLUE RIVER AT WATERVILLE, KANS.

LOCATION.—Chain gage in SE. ¼ sec. 16, T. 4 S., R. 6 E., half a mile north of Waterville and 1 mile below Corn Creek.

DRAINAGE AREA.—3,390 square miles.

RECORDS AVAILABLE.—June, 1922, to June, 1925; August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 6,210 second-feet May 11 (gage height, 12.35 feet); minimum, 94 second-feet Aug. 26 (gage height, 1.82 feet). 1922–1925, 1928–29: Maximum discharge, about 13,200 second-feet July 13, 1923 (gage height, 15.4 feet); minimum, 76 second-feet Dec. 19 and 20, 1924.

REMARKS.—Records good except those for period of ice effect, Jan. 1 to Mar. 6, which are fair.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	118	279	220			522	231	292	1,930	266	173	209
2	118	1,130	220	160		670	210	279	2,000	242	148	173
3	118	873	220			1,040	210	266	2,240	220	140	140
4	118	916	200			1,420	200	254	1,500	210	173	132
5	118	750	210	140		1,790	191	254	670	210	104	125
6	118	710	346			2,170	210	254	522	200	140	125
7	118	670	200			2,420	1,180	254	460	200	132	118
8	118	670	916	130	140	1,040	522	242	374	182	132	125
9	111	592	1,040			916	360	242	360	182	140	148
10	125	522	1,000			670	254	242	332	200	118	242
11	111	430	1,000			556	242	4,120	430	242	140	182
12	111	374	210			522	220	4,520	318	318	140	164
13	111	346	220			490	210	4,360	430	210	132	164
14	750	305	200			402	210	1,220	266	220	111	148
15	2,960	292	210	160		374	318	710	242	182	118	140
16	3,570	279	191			346	242	556	220	173	118	132
17	1,650	402	210			332	231	460	210	173	111	125
18	916	790	210		700	305	220	430	200	191	118	118
19	710	490	210			292	1,860	402	191	173	104	118
20	556	332	200			279	2,230	360	3,270	220	104	118
21	430	266	402			254	2,840	332	1,450	182	111	118
22	402	266	592			220	1,450	346	2,560	140	132	118
23	346	242	592	150	800	220	873	332	2,360	132	104	118
24	318	231	522			210	556	318	1,550	132	104	111
25	292	231	430			200	490	790	1,310	140	104	118
26	266	220	279			191	430	750	959	132	98	111
27	254	231	200		550	191	332	360	556	125	111	111
28	254	220	191	140		191	318	292	374	279	148	104
29	242	220	191		-------	191	318	266	332	292	148	118
30	231	231	191		-------	191	305	254	279	231	191	111
31	231	-------	191		-------	191	-------	242	-------	191	332	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	3,570	111	513	31,500
November	1,130	220	450	26,800
December	1,040	191	362	22,300
January	-------	-------	149	9,160
February	-------	-------	402	22,300
March	2,420	191	607	37,300
April	2,840	191	582	34,600
May	4,520	242	774	47,600
June	3,270	191	930	55,300
July	318	125	200	12,300
August	332	98	135	8,300
September	242	104	136	8,090
The year	4,520	98	436	316,000

Digitized by Google

SOLDIER CREEK AT TOPEKA, KANS.

LOCATION.—Chain gage in NW. ¼ sec. 18, T. 11 S., R. 15 E., at State Industrial School in Topeka.
DRAINAGE AREA.—304 square miles.
RECORDS AVAILABLE.—May to September, 1929.
EXTREMES.—Maximum discharge during period, 5,010 second-feet June 7 (gage height, 18.30 feet); minimum not determined.
REMARKS.—Records poor.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1		4,000	77	10	*5	16		162	51	6	11
2		3,380	72	9	5	17		153	48	5	10
3		1,690	72	8	5	18		146	35	5	*10
4		1,490	68	8	6	19		630	23	5	*9
5		572	64	7	6	20		2,440	20	4	*9
6		438	544	8	5	21		1,080	18	4	*8
7		2,620	212	8	5	22		1,490	17	4	*8
8		2,270	118	7	5	23	111	3,560	16	4	7
9		544	35	7	5	24	111	1,360	15	4	*7
10		386	720	64	5	25	98	295	14	4	*6
11		334	490	9	5	26	98	146	13		*6
12		282	104	9	7	27	98	98	12		*5
13		234	64	8	6	28	98	87	12	*4	4
14		162	59	8	6	29	92	82	12		*4
15		162	55	7	*8	30	104	82	12		*4
						31	1,360		11	4	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May 23-31	1,360	92	241	4,300
June	4,000	82	1,010	60,100
July	720	11	99.5	6,120
August	64	4	7.94	488
September	11	4	6.40	381
The period				71,400

* Estimated.

Digitized by Google

DELAWARE RIVER AT VALLEY FALLS, KANS.

LOCATION.—Chain gage in SW. ¼ sec. 18, T. 8 S., R. 18 E., at Valley Falls, 500 feet below Walnut Creek.

DRAINAGE AREA.—922 square miles.

RECORDS AVAILABLE.—June, 1922, to September, 1929.

EXTREMES.—Maximum discharge during year, about 27,500 second-feet Apr. 19 (gage height, 28.41 feet); minimum, 7 second-feet Sept. 30 (gage height, 2.74 feet).

1922–1929: Maximum discharge, about 30,000 second-feet June 16, 1925 (gage height, 29.72 feet); minimum, 1.3 second-feet Oct. 28, 1922 (gage height, 1.04 feet).

REMARKS.—Records good except those for period of ice effect, Jan. 8 to Mar. 31, and for other estimated periods, which are fair. Observations discontinued Apr. 1 to June 9.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	June	July	Aug.	Sept.
1	50	111	302	344		*570	-------	314	*54	16
2	45	1,380	288	330		490	-------	346	52	17
3	40	945	288	288		346	-------	266	*51	15
4	33	945	302	262		298	-------	235	50	14
5	26	865	302	213		*259	-------	220	50	13
6	23	672	316	202	*250	220	-------	235	80	12
7	21	566	*316	191		*213	-------	282	47	9
8	21	466	316	225		206	-------	298	42	11
9	21	316	316	985		*182	-------	206	39	11
10	22	237	*316	1,020		159	570	178	38	11
11	21	213	316	985		*162	471	298	36	11
12	21	225	330	905		164	434	1,390	34	56
13	30	202	532	905		154	380	346	32	48
14	36	213	945	825		*152	330	250	30	45
15	53	237	905	786	*300	149	314	206	27	50
16	55	5,870	825	672		*149	298	*181	24	44
17	54	9,200	710	466		149	266	*156	24	39
18	51	13,000	636			*146	490	130	22	29
19	58	7,200	600		*500	144	330	*118	22	22
20	60	4,050	600			139	1,800	107	21	17
21	62	1,430	566		530	*142	860	107	22	17
22	70	905	566		650	144	4,440	107	22	17
23	81	672	600		650	149	*16,700	*98	21	14
24	80	532	600		776	154	4,280	90	19	14
25	75	498	600	*300	1,210	*152	902	89	14	11
26	64	466	600		1,120	149	818	73	27	10
27	59	466	600		*885	*144	570	66	57	8
28	75	404	636		650	139	398	66	40	8
29	94	374	636		-------	152	330	38	30	8
30	94	*338	636		-------	162	314	60	26	7
31	108	-------	636		-------	137	-------	55	17	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	108	21	51.7	3,180
November	13,000	111	1,770	105,000
December	945	288	521	32,000
January	1,020	191	445	27,400
February	-------	-------	449	24,900
March	570	137	196	12,100
June 10–30	-------	-------	1,680	69,900
July	1,390	38	213	13,100
August	54	14	33.5	2,060
September	56	7	20.1	1,200

* Estimated

Digitized by Google

WAKARUSA RIVER NEAR LAWRENCE, KANS.

LOCATION.—Chain gage in NW. ¼ sec. 24, T. 13 S., R. 19 E., 4 miles southwest of Lawrence and 11 miles above junction with Kansas River.
DRAINAGE AREA.—458 square miles.
RECORDS AVAILABLE.—April to September, 1929.
EXTREMES.—Maximum discharge during period, about 7,550 second-feet May 12 (gage height, 27.87 feet); minimum, 0.4 second-foot Sept. 29 (gage height, 2.04 feet).
REMARKS.—Records fair below 5,000 second-feet and poor above.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	250	3,250	54	9	3	16	------	379	88	36	7	1
2	------	339	4,170	57	9	2	17	------	304	76	30	6	1
3	------	282	4,340	52	11	3	18	------	1,420	76	49	30	1
4	------	240	1,020	46	6	3	19	------	1,070	104	28	80	2
5	------	230	408	44	12	2	20	------	339	617	26	46	2
6	------	230	327	44	5	2	21	------	260	282	22	4	2
7	------	230	379	63	5	2	22	------	230	408	22	3	2
8	------	210	1,070	42	5	2	23	------	210	802	16	3	2
9	------	190	304	42	11	2	24	------	180	327	19	2	2
10	------	170	250	44	10	2	25	------	160	210	14	3	2
11	------	979	210	57	14	2	26	------	180	150	14	3	2
12	------	7,360	170	80	15	1	27	304	190	112	11	4	2
13	------	3,550	160	70	25	2	28	579	150	88	14	4	1
14	------	1,020	130	52	15	2	29	393	130	76	13	5	1
15	------	598	100	40	9	1	30	271	190	84	10	4	1
							31	------	2,520	------	9	4	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 27–30	579	271	387	3,070
May	7,360	130	767	47,200
June	4,340	76	660	39,300
July	80	9	36.1	2,220
August	80	2	11.9	732
September	3	1	18.3	109
The period				92,600

Digitized by Google

STRANGER CREEK NEAR TONGANOXIE, KANS.

LOCATION.—Chain gage in NE. ¼ sec. 13, T. 11 S., R. 21 E., 4 miles east of Tonganoxie and 9 miles above junction with Kansas River.
DRAINAGE AREA.—406 square miles.
RECORDS AVAILABLE.—April to September, 1929.
EXTREMES.—Maximum discharge during period, 15,300 second-feet Apr. 21 (gage height, 27.31 feet); minimum, 1 second-foot Sept. 30 (gage height, 3.20 feet).
REMARKS.—Records fair.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	-------	221	4,250	116	12	5	16	-------	263	123	45	12	7
2	-------	207	9,700	116	11	4	17	-------	221	95	43	8	6
3	-------	179	8,000	102	10	3	18	-------	298	89	41	5	9
4	-------	165	4,800	89	8	3	19	-------	410	116	37	5	3
5	-------	158	1,320	83	7	2	20	-------	235	333	33	5	2
6	-------	165	375	72	9	2	21	15,300	186	270	24	4	9
7	-------	207	382	221	9	2	22	-------	165	1,150	22	4	5
8	-------	186	663	263	10	2	23	-------	151	4,450	22	3	4
9	-------	158	815	144	16	4	24	-------	144	4,930	21	3	4
10	-------	130	305	109	14	4	25	-------	123	5,680	21	3	3
11	-------	375	235	62	13	4	26	-------	123	319	20	14	2
12	-------	2,050	200	83	11	5	27	-------	123	235	18	11	2
13	-------	789	179	95	22	7	28	-------	116	200	17	24	2
14	-------	446	151	72	21	11	29	-------	102	165	16	14	2
15	-------	347	130	55	15	10	30	263	137	137	14	13	1
							31	-------	1,050	-------	13	8	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May	2,050	102	311	19,100
June	9,700	89	1,660	98,800
July	263	13	67.4	4,140
August	24	3	10.5	646
September	11	1	4.3	256
The period				123,000

Digitized by Google

GRAND RIVER BASIN

GRAND RIVER NEAR GALLATIN, MO.

LOCATION.—Chain gage in NW. ¼ sec. 16, T. 59 N., R. 27 W., at highway bridge 1,000 feet above Chicago, Rock Island & Pacific Railway bridge, and 2 miles northeast of Gallatin. Zero of gage is 712.83 feet above mean sea level.

DRAINAGE AREA.—2,250 square miles.

RECORDS AVAILABLE.—June, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 56,800 second-feet June 2 (gage height, 37.38 feet); minimum discharge, 37 feet Sept. 29 and 30; minimum gage height, 3.45 feet Oct. 12, Sept. 29, and 30.

1921–1929: Maximum discharge, that of June 2, 1929; minimum, 10 second-feet while river was dammed upstream May 15, 1924 (gage height, 1.55 feet).

Maximum stage known, 39.3 feet in July, 1909.

REMARKS.—Records good except those for period of ice effect, Jan. 2 to Feb. 25, which are poor. Discharge estimated May 25 and June 9.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	224	415	6,050	190	226	13,400	6,880	1,710	20,000	208	620	60
2	206	15,600	3,590	190	226	8,030	5,220	1,040	51,400	217	302	60
3	182	22,100	2,240	208	226	6,880	1,960	770	44,800	302	226	60
4	166	24,500	1,810	190	226	10,400	1,040	650	40,100	172	324	78
5	166	12,900	1,520	172	226	9,540	770	565	17,600	244	190	66
6	166	3,460	770	157	226	10,900	590	540	3,400	16,100	172	55
7	158	1,910	740	157	226	15,600	590	590	1,760	27,600	150	55
8	190	1,430	770	142	226	17,600	440	590	2,080	37,100	150	50
9	182	1,150	515	157	226	10,900	368	465	1,540	14,600	142	55
10	151	970	540	172	226	6,950	1,150	415	1,000	2,130	142	262
11	137	900	540	244	226	4,850	4,620	390	800	1,560	134	127
12	123	830	650	900	226	5,600	2,480	770	680	8,190	134	92
13	130	740	830	830	244	9,620	1,480	1,270	590	6,500	134	85
14	772	650	1,390	770	244	9,540	800	1,000	515	1,960	113	78
15	588	650	3,720	710	244	6,720	3,400	770	465	1,110	106	72
16	354	2,300	3,020	650	262	6,050	3,460	590	390	1,080	99	72
17	5,000	20,300	1,810	565	262	3,850	1,150	490	346	900	85	60
18	14,300	37,600	1,710	515	262	2,020	710	415	324	650	85	55
19	11,400	47,800	1,110	465	262	1,610	3,330	390	280	540	78	50
20	5,300	39,100	620	465	262	1,310	23,000	302	970	465	78	50
21	1,270	7,710	415	465	262	1,110	32,100	262	2,300	390	72	55
22	1,080	3,080	346	465	244	900	34,600	226	830	346	72	172
23	3,990	2,600	368	490	244	800	23,000	208	4,340	302	113	150
24	2,480	1,520	390	590	244	680	5,220	190	1,350	280	127	127
25	970	1,270	415	650	262	620	5,900	315	650	262	92	92
26	590	1,080	346	490	10,600	540	8,600	440	440	262	85	72
27	515	1,040	515	346	12,200	490	3,780	302	324	217	78	55
28	2,840	970	465	280	14,800	440	2,540	226	346	208	66	46
29	1,660	970	415	262	-------	390	3,080	190	440	199	67	37
30	680	2,840	440	244	-------	368	2,780	172	244	199	60	37
31	490	-------	415	226	-------	540	-------	935	-------	226	60	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	14,300	123	1,820	0.809	0.93
November	47,800	415	8,610	3.83	4.27
December	6,050	346	1,240	.551	.64
January	900	142	399	.177	.20
February	14,800	226	1,560	.693	.72
March	17,600	368	5,430	2.41	2.78
April	34,600	368	6,170	2.74	3.06
May	1,710	172	554	.246	.28
June	51,400	244	6,680	2.97	3.31
July	37,100	172	4,020	1.79	2.06
August	620	60	141	.063	.07
September	262	37	79.5	.035	.04
The year	51,400	37	3,040	1.35	18.36

Digitized by Google

GRAND RIVER NEAR SUMNER, MO.

LOCATION.—Chain gage in NE. ¼ sec. 29, T. 56 N., R. 21 W., at highway bridge 80 feet below Chicago, Burlington & Quincy Railroad bridge and 2 miles southwest of Sumner. Zero of gage is 630.77 feet above mean sea level.

DRAINAGE AREA.—6,880 square miles.

RECORDS AVAILABLE.—April, 1924, to September, 1929.

EXTREMES.—Maximum discharge during year, 110,000 second-feet June 4; maximum gage height, 35.35 feet Nov. 20; minimum discharge, 210 second-feet Sept. 8 and 9.

1924–1929: Maximum discharge, that of June 4, 1929; minimum discharge, 162 second-feet Dec. 23–27, 1927; minimum gage height, 2.80 feet Dec. 2, 1924.

Maximum stage known, 36.7 feet July 9, 1909 (discharge, about 150,000 second-feet).

REMARKS.—Records good except those for period of ice effect, Jan. 3 to Feb. 25, which are poor.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	890	2,260	6,860	1,740	1,560	42,800	17,700	9,360	15,700	1,020	500	240
2	850	14,400	10,300	1,230	1,400	46,700	27,300	5,850	35,000	890	1,070	240
3	810	26,500	8,280	1,180	1,280	45,900	16,300	4,430	67,000	850	810	225
4	810	32,300	5,530	1,180	1,230	40,000	9,540	3,680	106,000	930	770	225
5	730	35,300	4,810	1,120	1,180	38,600	5,450	3,230	107,000	850	850	500
6	730	37,900	3,980	1,120	1,180	36,200	4,130	2,950	80,700	890	610	315
7	650	36,800	2,810	1,070	1,180	35,600	3,230	2,950	52,900	19,600	930	240
8	730	26,200	2,530	1,070	1,180	37,400	2,950	2,950	28,900	26,900	570	210
9	730	13,200	2,400	1,070	1,180	38,000	2,670	2,810	14,500	29,300	975	210
10	690	5,530	2,400	1,740	1,180	38,000	3,980	2,460	8,460	31,300	610	1,810
11	610	4,280	2,400	2,400	1,180	33,300	13,400	2,260	4,280	24,900	500	2,530
12	570	3,830	2,400	2,810	1,180	21,600	13,200	8,460	3,760	18,400	500	1,120
13	535	3,530	2,810	3,230	1,180	22,200	8,820	11,100	2,810	20,600	448	570
14	500	2,950	7,380	3,160	1,180	27,700	5,690	10,500	2,200	13,900	395	430
15	1,070	2,950	10,300	3,020	1,230	30,300	4,500	11,400	1,810	6,440	378	345
16	1,740	8,000	12,200	2,810	1,230	31,800	6,690	6,690	1,680	7,120	360	315
17	1,400	30,800	13,700	2,600	1,280	30,800	7,380	4,360	1,500	10,800	330	285
18	11,700	58,900	11,700	2,460	1,280	21,100	4,360	4,200	1,340	9,000	330	270
19	24,100	95,500	7,560	2,400	1,280	11,600	3,230	5,290	1,280	4,200	330	240
20	26,800	103,000	4,890	2,260	1,230	6,600	17,700	4,130	3,090	2,140	315	315
21	22,000	89,500	3,090	2,140	1,230	5,370	40,700	2,810	6,010	1,450	315	4,430
22	8,900	80,800	2,140	2,200	1,230	4,660	76,800	2,260	4,890	1,180	315	2,140
23	8,460	50,600	2,000	2,400	1,230	4,130	85,900	2,000	4,970	1,020	300	850
24	11,800	30,800	1,940	2,600	1,560	3,680	74,200	2,000	7,380	930	285	570
25	7,200	15,600	1,940	2,740	2,070	3,380	57,500	1,880	4,810	850	285	448
26	3,680	7,200	2,000	2,810	20,200	3,460	40,000	3,090	2,140	770	360	395
27	2,600	4,200	2,140	2,600	28,000	2,950	33,800	2,740	1,500	730	345	345
28	7,740	3,600	2,200	2,330	33,800	2,670	20,600	2,140	1,280	650	330	315
29	10,100	3,380	2,260	2,070	-------	2,400	14,700	2,000	1,280	610	300	285
30	5,770	3,380	2,200	1,940	-------	2,260	13,200	1,810	1,230	570	285	270
31	3,020	-------	2,070	1,680	-------	2,670	-------	8,280	-------	535	270	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	26,800	500	5,420	0.788	0.91
November	103,000	2,260	27,800	4.04	4.51
December	13,700	1,940	4,810	.699	.81
January	3,230	1,070	2,100	.305	.35
February	33,800	1,180	4,080	.593	.62
March	46,700	2,260	21,700	3.15	3.63
April	85,900	2,670	21,200	3.08	3.44
May	11,400	1,810	4,520	.657	.76
June	107,000	1,230	19,200	2.79	3.11
July	31,300	535	7,720	1.12	1.29
August	1,070	270	483	.070	.08
September	4,430	210	689	.100	.11
The year	107,000	210	9,940	1.44	19.62

Digitized by Google

THOMPSON RIVER AT TRENTON, MO.

LOCATION.—Chain gage in SW. ¼ sec. 18, T. 61 N., R. 24 W., at bridge on State highway No. 6, 1 mile northwest of Trenton. Zero of gage is about 737.15 feet above mean sea level.

DRAINAGE AREA.—1,670 square miles.

RECORDS AVAILABLE.—August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 26,700 second-feet Nov. 18 (gage height, 22.31 feet); minimum, 53 second-feet Sept. 7 and 8.

1928–29: Maximum discharge, that of Nov. 18, 1928; minimum, 48 second-feet Sept. 8–10, 1928 (gage height, 2.05 feet).

Maximum stage known, 30.7 feet July 6, 1909.

REMARKS.—Records good except those for period of ice effect, Jan. 2 to Feb. 25, which are poor. Discharge estimated Dec. 9.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	104	210	3,800	178	150	6,880	5,620	1,500	12,500	234	178	64
2	94	12,600	1,930	164	150	3,300	4,200	1,120	24,600	223	157	62
3	94	14,200	1,100	150	150	1,240	1,700	780	20,800	223	478	60
4	90	12,200	1,260	137	150	4,620	1,180	680	7,540	212	150	56
5	85	5,420	1,930	137	150	3,400	890	498	2,440	194	131	56
6	90	2,200	890	125	150	5,390	730	478	1,440	3,500	125	55
7	157	1,420	362	125	150	10,600	630	478	1,000	6,230	580	53
8	104	1,080	505	125	150	9,000	538	422	2,120	1,630	178	53
9	85	830	485	150	150	7,680	1,180	422	1,060	680	131	1,440
10	76	770	465	164	150	5,170	2,620	374	835	630	119	280
11	67	715	428	178	150	3,600	2,620	290	1,300	945	113	108
12	59	640	282	164	164	5,620	2,050	780	730	6,750	108	96
13	63	465	410	150	164	8,550	1,840	538	538	4,000	102	91
14	377	465	3,600	150	178	8,250	1,240	3,300	458	835	91	75
15	137	960	6,020	150	178	7,270	2,200	1,120	498	630	86	75
16	120	715	3,400	150	178	7,680	1,180	730	390	3,700	86	80
17	445	22,200	1,750	150	178	3,400	835	580	374	1,980	80	70
18	12,800	26,500	960	150	164	2,050	680	458	344	730	80	58
19	10,000	19,500	770	150	164	1,630	4,840	358	304	538	80	68
20	4,970	7,100	377	150	164	1,440	23,600	331	292	344	86	1,700
21	1,080	2,830	320	150	164	1,180	20,200	292	280	280	80	256
22	3,400	1,750	308	150	178	1,000	12,300	280	280	245	75	150
23	3,200	1,100	334	164	194	835	8,100	256	358	223	86	113
24	1,100	890	394	164	228	730	3,000	245	304	194	86	91
25	428	715	347	164	525	730	7,010	234	268	178	75	86
26	295	570	445	164	22,200	680	7,540	245	234	178	70	80
27	4,530	445	485	150	7,820	538	3,200	256	256	171	68	75
28	2,290	445	347	150	10,700	498	2,620	268	268	157	66	75
29	410	428	295	150	.....	458	5,980	234	223	150	62	70
30	308	2,290	238	150	.....	422	3,300	234	203	144	60	66
31	238	.....	194	150	.....	630	.....	1,000	.....	331	58	.....

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	12,800	59	1,520	0.910	1.05
November	26,500	210	4,720	2.83	3.16
December	6,020	194	1,110	.665	.77
January	178	125	152	.091	.10
February	12,200	150	1,610	.964	1.00
March	10,600	422	3,690	2.21	2.55
April	23,600	538	4,450	2.66	2.97
May	3,300	234	609	.365	.42
June	24,600	203	2,740	1.64	1.83
July	6,750	144	1,180	.707	.82
August	580	58	126	.075	.09
September	1,700	53	189	.113	.14
The year	26,500	53	1,830	1.10	14.89

Digitized by Google

MEDICINE CREEK NEAR GALT, MO.

LOCATION.—Chain gage in NW. ¼ sec. 34, T. 62 N., R. 22 W., at Quincy, Omaha & Kansas City Railroad bridge 1 mile above West Medicine Creek and 1½ miles east of Galt.

DRAINAGE AREA.—225 square miles.

RECORDS AVAILABLE.—July, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 6,600 second-feet Apr. 20 (gage height, 15.60 feet), which probably was lower than flood of Nov. 18; minimum, 3 second-feet Aug. 29, 30, and Sept. 3–5.

1921–1929: Maximum discharge, that of Apr. 20, 1929; minimum, less than 1 second-foot Aug. 22 and 29, 1922.

REMARKS.—Records fair except those for periods of ice effect, Dec. 19–22 and Jan. 2 to Feb. 26, and those estimated, which are poor. Discharge not determined Oct. 14–18, 21, 23, and Nov. 1 to Dec. 9.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	42	-------	19	75	1,340	750	118	4,460	28	• 11	5
2	38	-------	18	75	422	289	80	4,550	26	• 9	5
3	38	-------	18	75	380	205	62	3,420	20	• 7	3
4	36	-------	18	75	606	64	59	386	26	• 6	3
5	33	-------	18	84	750	42	56	210	27	• 7	3
6	31	-------	15	84	750	37	59	151	306	• 11	5
7	30	-------	15	75	750	30	59	112	151	• 150	5
8	28	-------	15	66	720	26	59	118	128	56	6
9	28	-------	18	66	360	22	• 53	72	72	38	47
10	28	48	28	59	181	76	• 47	56	43	30	140
11	26	52	33	52	160	181	42	52	310	28	• 94
12	26	59	38	52	259	140	197	48	582	21	47
13	26	93	38	45	606	72	118	41	340	20	18
14	-------	257	38	45	534	43	386	38	112	16	12
15	-------	530	38	52	259	68	240	48	1,730	13	11
16	-------	171	38	59	205	46	88	41	1,210	13	10
17	-------	137	38	59	112	34	66	37	444	11	10
18	-------	98	38	66	81	30	59	36	157	12	10
19	274	66	38	66	64	40	80	56	81	• 10	360
20	148	52	45	66	52	6,600	48	36	56	9	259
21	-------	38	45	59	48	6,450	45	28	49	9	86
22	1,180	33	52	59	40	2,470	38	32	34	7	26
23	-------	23	66	59	36	1,000	36	36	32	6	22
24	240	36	66	66	• 32	413	33	45	• 27	4	19
25	104	48	93	104	• 29	1,700	38	41	• 23	5	15
26	75	38	115	148	25	660	45	32	• 18	5	14
27	590	38	115	4,110	20	257	52	52	• 13	6	12
28	625	42	104	2,250	19	1,090	38	34	• 8	5	11
29	225	59	93	-------	19	1,180	30	28	• 10	3	9
30	198	33	84	-------	18	197	33	• 28	• 14	3	6
31	171	42	75	-------	157	-------	52	-------	• 8	4	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
December 10–31	530	23	90.6	0.403	0.33
January	115	15	47.5	.211	.24
February	4,110	45	291	1.29	1.34
March	1,340	18	292	1.30	1.50
April	6,600	22	807	3.59	4.00
May	386	30	77.9	.346	.40
June	4,550	28	477	2.12	2.36
July	1,730	8	212	.942	1.09
August	150	3	17.1	.076	.09
September	360	3	42.4	.188	.21

• Estimated.

Digitized by Google

LOCUST CREEK NEAR MILAN, MO.

LOCATION.—Chain gage in SW. ¼ sec. 8, T. 62 N., R. 20 W., at bridge on State highway No. 6, 3½ miles southwest of Milan.

DRAINAGE AREA.—225 square miles.

RECORDS AVAILABLE.—July, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 3,880 second-feet Nov. 18 (gage height, 20.07 feet); minimum discharge, 4 second-feet Oct. 13; minimum gage height, 2.28 feet Sept. 8.

1921–1929: Maximum discharge, that of Nov. 18, 1928; minimum, 0.8 second-foot Oct. 1, 1922.

REMARKS.—Records poor prior to Mar. 4 and fair thereafter. Discharge estimated Oct. 21, 23–25, Dec. 4–10, and July 16–18. Stage-discharge relation affected by ice Jan. 2 to Mar. 4.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	746	123	25	67	2,230	1,190	154	2,230	20	14	7
2	18	3,820	123	18	67	2,000	944	116	3,490	16	12	6
3	14	3,780	123	14	67	1,450	206	88	2,800	16	9	6
4	12	3,300	114	14	61	1,580	146	74	2,650	16	8	6
5	9	1,100	104	14	55	1,800	88	46	280	11	9	6
6	8	872	95	11	49	1,940	67	64	138	88	12	5
7	8	828	86	14	44	2,030	61	70	162	1,160	304	5
8	8	300	77	14	44	2,170	44	58	116	256	116	5
9	8	280	68	14	39	686	39	52	162	102	34	95
10	7	152	58	18	39	344	102	46	61	130	18	670
11	7	152	49	22	39	320	116	81	55	1,110	13	130
12	7	152	292	26	39	320	130	146	44	1,320	13	58
13	4	152	292	26	44	706	78	197	39	1,160	12	39
14	6	152	400	30	44	850	55	162	30	162	9	28
15	7	144	856	30	49	504	49	292	26	770	7	21
16	226	806	268	26	49	434	44	102	28	500	6	16
17	226	3,070	179	26	49	332	39	74	28	300	6	12
18	406	3,880	138	26	44	226	34	55	25	160	7	11
19	448	3,850	102	26	39	176	372	42	25	95	7	280
20	332	1,240	52	26	34	152	3,230	39	23	64	7	1,190
21	400	280	52	30	30	129	3,070	34	20	52	6	330
22	462	188	49	34	30	115	2,560	30	24	36	5	102
23	282	146	39	67	39	108	1,220	30	52	30	7	49
24	200	138	30	102	55	101	358	28	28	26	7	34
25	374	138	32	130	102	94	1,500	28	24	22	9	26
26	648	130	39	123	944	73	1,350	30	19	18	52	21
27	938	130	44	116	1,720	66	344	30	20	17	22	18
28	938	130	46	95	2,000	66	330	25	19	11	14	15
29	686	123	44	81	-------	63	1,110	30	17	12	12	14
30	462	123	44	74	-------	63	330	88	19	16	10	13
31	462	-------	49	67	-------	136	-------	32	-------	11	8	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	938	4	246	1.09	1.26
November	3,880	123	1,010	4.49	5.01
December	856	30	131	.582	.67
January	130	11	43.2	.192	.22
February	2,000	30	210	.933	.97
March	2,230	63	686	3.05	3.52
April	3,230	34	640	2.84	3.17
May	292	25	75.6	.336	.39
June	3,490	17	422	1.88	2.10
July	1,320	11	248	1.10	1.27
August	304	5	25.0	.111	.13
September	1,190	5	107	.476	.53
The year	3,880	4	319	1.42	19.24

Digitized by Google

LOCUST CREEK NEAR LINNEUS, MO.

LOCATION.—Chain gage in NE. ¼ sec. 34, T. 59 N., R. 21 W., at highway bridge 3 miles northwest of Linneus.
DRAINAGE AREA.—550 square miles.
RECORDS AVAILABLE.—April to September, 1929.
EXTREMES.—Maximum discharge during period, 14,100 second-feet Apr. 21 (gage height, 20.89 feet); minimum, 15 second-feet Aug. 22 and Sept. 4 (gage height, 2.83 feet).
REMARKS.—Records fair. Discharge estimated July 19 and 20.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	-------	357	8,680	95	47	21	16	218	399	134	3,040	19	35
2	-------	237	9,440	90	87	19	17	190	228	126	3,040	19	28
3	-------	190	6,720	71	49	17	18	378	199	126	2,950	18	17
4	-------	170	5,550	54	43	15	19	2,710	143	118	2,010	16	277
5	257	143	2,070	45	46	25	20	9,540	118	118	1,070	16	2,710
6	237	152	422	317	378	20	21	13,700	96	118	126	16	2,070
7	208	170	357	1,710	180	22	22	6,630	83	134	101	15	208
8	190	161	247	605	218	16	23	2,790	80	134	87	16	180
9	208	126	555	770	126	68	24	1,500	71	134	74	16	170
10	555	109	237	277	65	1,500	25	4,220	71	118	65	16	80
11	770	1,430	199	297	45	1,020	26	2,870	80	109	58	56	52
12	422	1,430	180	3,290	36	170	27	1,020	87	118	57	47	45
13	297	655	170	2,220	34	80	28	1,360	83	118	47	40	37
14	247	1,360	152	337	25	68	29	1,430	80	96	36	36	30
15	247	480	143	1,850	22	45	30	1,020	770	83	72	26	30
							31	-------	2,870	-------	65	23	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
April 5-30	13,700	190	2,060	3.73	3.61
May	2,870	71	407	.740	.85
June	9,440	83	1,230	2.24	2.50
July	3,290	36	804	1.46	1.68
August	378	15	58.1	.106	.12
September	2,710	15	302	.550	.61

Digitized by Google

YELLOW CREEK NEAR ROTHVILLE, MO.

LOCATION.—Chain gage on line between NW. ¼ sec. 31, T. 56 N., R. 19 W., and NE. ¼ sec. 36, T. 56 N., R. 20 W., at highway bridge 2½ miles southwest of Rothville.

DRAINAGE AREA.—442 square miles.

RECORDS AVAILABLE.—April to September, 1929.

EXTREMES.—Maximum discharge during period, 6,450 second-feet Apr. 22 (gage height, 21.04 feet); minimum, 4 second-feet Aug. 20, and 23-25 (gage height, 2.5 feet).

REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	-------	322	1,650	64	9	10	16	180	608	52	138	9	20
2	-------	224	2,270	45	14	8	17	159	358	43	482	7	13
3	-------	194	2,850	35	32	6	18	145	331	39	376	7	10
4	-------	159	4,100	28	33	5	19	187	506	349	138	6	8
5	-------	120	4,100	26	45	8	20	1,250	288	1,190	69	4	8
6	-------	114	2,470	24	35	126	21	2,770	152	494	47	5	166
7	194	114	1,480	37	15	41	22	5,950	102	240	32	5	518
8	322	114	735	304	16	14	23	5,950	84	288	26	4	395
9	437	96	426	173	90	8	24	4,100	74	376	21	4	120
10	842	90	180	166	47	6	25	3,150	64	608	16	4	54
11	1,520	84	114	296	33	5	26	2,850	62	194	15	5	32
12	922	405	145	264	59	272	27	1,870	56	96	12	5	22
13	405	1,090	120	152	47	173	28	1,070	54	248	11	6	15
14	264	1,400	96	264	27	56	29	634	49	187	10	18	10
15	208	954	64	187	12	30	30	437	47	108	11	14	9
							31	-------	437	-------	10	10	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
April 7–30	5,950	145	1,490	3.37	3.01
May	1,400	47	282	.638	.74
June	4,100	39	844	1.91	2.13
July	482	10	112	.253	.29
August	90	4	20.2	.046	.05
September	518	5	72.3	.164	.18

Digitized by Google

CHARITON RIVER BASIN

CHARITON RIVER AT ELMER, MO.

LOCATION.—Chain gage in SW. ¼ SW. ¼ sec. 2, T. 59 N., R. 16 W., at Atchison, Topeka & Santa Fe Railway bridge three-fourths mile southwest of Elmer. Zero of gage is 687.85 feet above mean sea level.

DRAINAGE AREA.—1,660 square miles.

RECORDS AVAILABLE.—July, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 22,500 second-feet Nov. 17 (gage height, 24.06 feet); minimum, 77 second-feet Sept. 4 (gage height, 2.72 feet). 1921–1929: Maximum discharge, that of Nov. 17, 1928; maximum gage height, 27.56 feet Sept. 21, 1926; minimum discharge, 14 second-feet Sept. 26, 1927.

REMARKS.—Records fair except those for periods of ice effect, Jan. 2 to Feb. 25, and for high stages, which are poor.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	394	3,230	1,090	410	587	*5,200	6,200	6,520	3,280	220	206	105
2	331	4,590	1,220	342	515	5,360	4,950	5,630	6,880	264	191	98
3	331	6,500	1,830	309	410	*6,180	3,800	4,790	7,750	234	176	84
4	293	6,000	1,830	278	342	7,000	3,410	3,160	8,500	206	147	77
5	257	5,000	1,540	249	278	7,600	3,160	1,680	8,800	193	140	112
6	293	4,510	1,360	220	249	7,750	3,160	1,320	8,200	180	350	119
7	274	4,350	955	220	249	7,600	1,830	1,090	7,000	1,830	726	119
8	331	4,040	665	193	249	7,360	1,540	955	5,630	3,160	*492	133
9	274	3,900	665	193	249	7,000	1,000	865	4,420	3,670	257	2,370
10	257	3,290	587	193	249	6,200	1,090	745	2,130	1,830	191	3,550
11	240	1,220	625	168	249	5,030	1,140	665	1,180	825	154	2,480
12	223	1,140	587	168	249	6,400	1,140	2,980	955	1,500	133	1,300
13	198	940	2,570	168	249	6,000	910	1,540	745	2,400	126	498
14	191	790	4,490	193	249	5,630	1,000	2,130	625	2,520	112	350
15	240	662	3,930	193	249	6,520	1,360	1,830	550	4,870	105	223
16	860	1,350	*4,600	193	249	6,000	1,140	1,360	515	5,110	98	168
17	940	22,500	5,270	193	249	5,270	865	1,000	445	5,360	91	161
18	3,170	13,300	4,560	220	278	4,790	705	955	445	6,300	98	147
19	3,290	16,900	3,540	220	278	4,140	2,030	785	1,000	6,000	91	524
20	3,290	15,600	2,740	220	309	3,740	9,420	665	*610	5,630	98	2,100
21	2,420	13,500	1,580	249	342	3,160	13,200	515	445	4,430	98	1,020
22	2,590	12,500	910	249	375	*2,220	16,200	515	825	2,870	105	524
23	2,930	10,500	665	955	445	1,270	14,000	480	410	1,540	133	*374
24	3,620	9,100	587	1,450	665	1,180	11,800	445	358	662	184	223
25	3,970	7,120	587	1,450	1,540	1,040	12,600	410	294	472	214	184
26	4,110	6,300	587	1,450	6,200	910	11,700	392	249	331	274	161
27	3,830	4,490	550	1,360	5,030	785	12,000	445	220	274	331	140
28	2,930	3,670	550	1,270	5,030	665	10,900	445	326	240	274	126
29	1,890	2,180	550	1,140	-------	625	8,650	410	392	214	240	112
30	1,640	1,450	*498	955	-------	550	7,240	392	294	184	168	112
31	1,590	-------	445	785	-------	3,160	-------	1,360	-------	198	98	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	4,110	191	1,520	0.916	1.06
November	22,500	662	6,350	3.83	4.27
December	5,270	445	1,680	1.01	1.16
January	1,450	168	511	.308	.36
February	6,200	249	915	.551	.57
March	7,750	550	4,400	2.65	3.06
April	16,200	705	5,600	3.37	3.76
May	6,520	392	1,500	.904	1.04
June	8,800	220	2,450	1.48	1.65
July	6,300	180	2,060	1.24	1.43
August	726	91	197	.119	.14
September	3,550	77	590	.355	.40
The year	22,500	77	2,310	1.39	18.90

* Estimated.

Digitized by Google

CHARITON RIVER NEAR KEYTESVILLE, MO.

LOCATION.—Chain gage in SE. ¼ sec. 25, T. 54 N., R. 18 W., 4½ miles northeast of Keytesville.

DRAINAGE AREA.—1,950 square miles.

RECORDS AVAILABLE.—April to September, 1929.

EXTREMES.—Maximum discharge during period, 18,700 second-feet Apr. 25 (gage height, 21.66 feet); minimum, 85 second-feet Sept. 4 (gage height, 2.89 feet).

Maximum stage known, 22.54 feet Nov. 18, 1928.

REMARKS.—Records good. Discharge estimated Sept. 7–9 and 19.

Daily and monthly discharge, in second-feet, 1928–29

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1		8,760	1,520	334	356	111	16	1,340	2,100	584	3,630	183	312
2		7,840	5,890	312	334	102	17	1,090	1,250	512	4,840	147	260
3		6,800	7,680	270	290	96	18	870	1,860	466	5,540	138	220
4		5,400	8,220	270	270	85	19	818	1,700	1,110	6,200	129	215
5		2,960	8,760	230	250	96	20	3,810	922	2,640	6,700	116	210
6		1,660	9,100	230	270	129	21	7,400	688	1,370	6,700	120	2,320
7		1,310	8,760	488	714	140	22	11,000	610	766	5,680	120	1,250
8		1,110	8,760	2,190	1,030	150	23	13,000	536	1,060	3,900	120	610
9	3,680	948	7,020	3,180	740	170	24	15,100	512	714	1,860	120	400
10	3,500	818	4,900	3,000	422	1,600	25	18,100	512	922	974	230	290
11	2,910	766	2,100	1,280	334	3,540	26	16,900	466	488	714	260	240
12	1,860	4,360	1,310	974	270	2,500	27	15,100	444	378	560	201	210
13	1,310	4,100	1,060	1,860	230	1,200	28	13,500	488	610	488	356	174
14	1,110	3,630	792	2,600	201	636	29	12,000	466	714	444	290	156
15	1,230	3,000	662	1,820	183	444	30	11,000	512	444	400	210	147
							31		1,140		378	147	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
April 9–30	18,100	818	7,120	3.65	2.99
May	8,760	444	2,180	1.12	1.29
June	9,100	378	2,980	1.53	1.71
July	6,700	230	2,200	1.14	1.31
August	1,030	116	283	.145	.17
September	3,540	85	600	.308	.34

Digitized by Google

LAMINE RIVER BASIN

LAMINE RIVER AT CLIFTON CITY, MO.

LOCATION.—Chain gage in NW. ¼ sec. 16, T. 46 N., R. 19 W., at highway bridge 300 feet above Missouri, Kansas & Texas Railway bridge and three-fourths mile east of Clifton City. Zero of gage is 622.60 feet above mean sea level.

DRAINAGE AREA.—598 square miles.

RECORDS AVAILABLE.—June, 1922, to September, 1929.

EXTREMES.—Maximum discharge during year, 33,000 second-feet May 19 (gage height, 29.00 feet); minimum, 3 second-feet Aug. 25, 28–31, and Sept. 1 (gage height, 1.5 feet).

1922–1929: Maximum discharge, that of May 19, 1929; minimum, 1 second-foot Sept. 27, 1924.

Maximum stage known, 35.3 feet Sept. 18, 1905.

REMARKS.—Records good except those for period of ice effect, Jan. 25 to Feb. 17, which are poor.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8	33	127	95	47	440	3,010	82	212	74	15	3
2	8	66	99	99	47	337	920	10,400	5,840	66	14	4
3	8	55	99	95	47	272	510	11,000	11,500	55	11	5
4	8	51	90	90	33	257	337	1,600	11,500	51	9	31
5	1,120	39	82	475	33	272	272	1,930	760	47	8	2,240
6	272	33	74	3,140	33	304	212	3,010	510	44	6	257
7	108	31	66	1,680	33	337	184	2,920	422	58	6	144
8	62	29	62	1,520	33	272	6,580	920	388	36	388	84
9	36	25	58	1,520	33	212	12,300	720	288	127	16	51
10	25	22	58	5,140	33	184	12,900	510	212	212	10	32
11	20	20	58	3,190	33	162	6,110	371	179	118	16	24
12	17	20	62	1,440	33	257	1,280	7,400	1,000	104	24	22
13	15	22	422	1,200	33	580	650	21,700	5,670	95	14	20
14	14	22	1,480	960	33	510	510	9,950	3,550	66	8	18
15	13	20	510	960	47	1,080	440	2,880	440	44	6	16
16	405	5,140	405	800	66	7,330	337	1,760	304	95	5	14
17	212	10,400	4,040	580	212	6,980	288	880	212	39	4	12
18	242	11,000	4,790	1,200	1,360	960	242	18,200	162	31	4	12
19	176	1,240	880	3,140	304	650	212	21,700	2,470	25	4	11
20	90	510	545	1,280	212	510	920	3,940	2,060	20	4	46
21	51	337	371	720	152	422	2,380	760	1,360	16	4	21
22	86	272	288	580	113	337	880	545	388	15	4	14
23	242	212	227	1,120	95	272	510	405	475	14	4	21
24	179	173	198	371	86	242	2,740	320	580	14	4	20
25	90	152	179	184	3,640	212	9,100	272	272	12	3	17
26	58	132	168	132	4,640	2,920	3,320	242	242	12	5	14
27	41	113	162	108	1,120	720	880	354	168	10	4	12
28	33	108	157	86	510	440	720	304	118	9	3	11
29	27	104	152	66	-------	320	475	212	99	9	3	10
30	23	108	137	47	-------	272	108	212	82	11	3	10
31	22	-------	122	47	-------	1,200	-------	320	-------	9	3	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,120	8	120	0.201	0.23
November	11,000	20	1,020	1.71	1.91
December	4,790	58	522	.873	1.01
January	5,140	47	1,030	1.72	1.98
February	4,640	33	466	.779	.81
March	7,330	162	944	1.58	1.82
April	12,900	108	2,310	3.86	4.31
May	21,700	82	4,060	6.79	7.83
June	11,500	82	1,720	2.88	3.21
July	212	9	49.6	.083	.10
August	388	3	20.1	.034	.04
September	2,240	3	107	.179	.20
The year	21,700	3	1,030	1.72	23.45

Digitized by Google

OSAGE (MARAIS DES CYGNES) RIVER BASIN

OSAGE RIVER NEAR QUENEMO, KANS.

LOCATION.—Chain gage in NW. ¼ sec. 7, T. 17 S., R. 18 E., 2½ miles below Dragoon Creek and 3 miles east of Quenemo.

DRAINAGE AREA.—1,030 square miles.

RECORDS AVAILABLE.—June, 1922, to September, 1929.

EXTREMES.—Maximum gage height during year, 38.38 feet Nov. 17 (discharge not determined); minimum discharge, 3 second-feet Nov. 2 (gage height, 2.46 feet).

1922–1929: Maximum discharge, that of Nov. 17, 1928; no flow for days in July and August, 1926.

REMARKS.—Records good below 3,000 second-feet and fair to poor above. Stage-discharge relation affected by ice Jan. 4–30 and Feb. 18–21.

Daily and monthly discharge, in second-feet, 1928–29.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7	9	847	247	211	975	6,600	396	4,680	109	44	15
2	6	3	556	247	184	556	2,750	1,670	4,500	116	36	12
3	7	22	416	247	184	476	1,040	1,080	5,040	109	32	11
4	6	28	320	229	193	436	436	516	5,360	94	30	9
5	7	22	283	175	193	556	396	476	1,270	94	28	8
6	7	20	265	190	211	377	358	396	975	80	27	11
7	8	17	247	210	193	416	301	358	784	73	25	13
8	7	14	229	220	175	396	211	320	2,140	80	23	15
9	6	13	247	850	175	339	247	283	889	536	132	11
10	5	15	247	5,600	157	283	2,100	265	516	1,270	396	10
11	5	15	229	4,600	157	247	3,050	847	496	5,310	436	11
12	6	13	229	1,600	140	679	1,180	1,200	416	7,730	265	12
13	7	11	679	1,300	157	1,820	596	13,600	358	3,820	124	13
14	8	15	5,040	1,000	157	1,250	436	8,120	283	721	80	13
15	8	13	2,100	700	157	637	1,110	2,600	211	377	64	12
16	9	7,050	1,380	450	175	416	616	953	184	229	47	11
17	12	17,800	5,750	340	166	358	456	679	157	193	37	10
18	80	14,600	3,960	640	155	320	358	931	140	157	34	8
19	94	12,500	1,270	1,150	160	283	358	2,170	157	132	29	12
20	11	6,450	910	600	170	247	5,800	910	358	116	22	17
21	9	1,020	536	300	200	229	11,000	556	377	102	20	15
22	9	616	476	265	283	229	6,660	496	436	77	21	12
23	9	476	436	250	247	211	1,760	476	596	73	20	10
24	8	396	396	240	247	193	868	516	1,080	66	19	8
25	9	339	396	250	1,640	193	1,150	396	396	64	17	8
26	9	301	377	260	6,100	211	805	301	265	56	17	10
27	8	301	358	270	3,360	193	616	320	229	52	20	10
28	8	320	339	280	1,580	157	416	283	175	48	17	9
29	8	358	320	290	------	140	377	283	140	44	16	8
30	7	700	283	300	------	140	320	721	116	47	15	9
31	8	------	265	283	------	2,460	------	4,680	------	43	15	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	94	5	12.8	787
November	17,800	3	2,120	126,000
December	5,750	229	948	583,000
January	5,600	175	761	46,800
February	6,100	140	612	34,000
March	2,460	140	498	30,600
April	11,100	211	1,750	104,000
May	13,600	265	1,510	92,800
June	5,360	116	1,090	64,900
July	7,730	43	711	43,700
August	436	15	68	4,180
September	17	8	11.1	660
The year	17,800	3	838	607,000

Digitized by Google

OSAGE RIVER NEAR OTTAWA, KANS.

LOCATION.—Water-stage recorder in NW. ¼ sec. 6, T. 17 S., R. 20 E., three-fourths mile below Skunk Creek and 1½ miles southeast of Ottawa. Zero of gage is 852.6 feet above mean sea level.

DRAINAGE AREA.—1,250 square miles.

RECORDS AVAILABLE.—October, 1918, to September, 1929. August, 1902, to October, 1905, at Main Street Bridge in Ottawa.

EXTREMES.—Maximum discharge during year, about 58,400 second-feet Nov. 17 (gage height, 38.65 feet); minimum, 6 second-feet Sept. 7–12 (gage height, 1.3 feet).

1918–1929: Maximum discharge, that of Nov. 17, 1928; no flow June 27 and 28, 1920.

REMARKS.—Records good except those for period of ice effect, Jan. 5 to Feb. 10, which are fair. Diversion above station for water supply of Ottawa. Regulation caused by operations at dams upstream.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	58	986	360		1,190	6,440	473	3,760	130	58	14
2	10	102	833	307		765	3,440	1,370	3,670	127	62	15
3	11	86	577	346	280	607	986	1,690	3,570	122	52	14
4	13	60	488	360		547	638	799	4,000	110	42	14
5	15	44	430	345		517	532	636	4,250	100	42	10
6	16	38	388	330		517	458	562	716	88	40	8
7	17	33	360	315		517	388	532	748	79	36	6
8	15	32	333	300	250	473	374	473	2,160	79	32	6
9	13	31	322	1,700		402	388	416	1,330	307	132	6
10	12	30	322	5,400		346	1,730	374	700	1,550	302	6
11	12	29	325	5,600	243	346	2,000	1,510	532	3,620	473	6
12	12	26	328	3,500	197	502	1,840	9,660	430	5,610	360	6
13	12	26	1,050	2,400	187	1,660	884	11,600	430	5,230	175	7
14	12	25	4,250	1,400	197	1,770	684	12,200	360	1,620	103	7
15	13	28	3,530	400	187	850	1,620	6,970	277	444	64	8
16	22	7,500	2,400		238	622	1,190	1,330	238	297	50	10
17	19	39,700	5,390		360	532	748	700	200	223	41	10
18	54	46,300	5,010		502	473	607	562	189	183	36	11
19	30	28,000	2,200		532	416	782	1,690	292	158	24	11
20	20	18,600	1,090		532	374	3,000	1,020	748	134	20	11
21	16	8,210	799	350	430	346	9,410	473	684	116	18	12
22	17	1,190	684		312	312	8,320	323	1,120	103	16	10
23	15	716	607		247	292	3,440	257	4,100	91	16	10
24	16	668	577		302	272	1,410	205	1,440	88	17	8
25	15	592	562		1,260	247	1,190	171	765	76	15	8
26	17	517	547		5,230	223	884	219	402	74	16	7
27	20	473	547		4,050	207	700	320	323	68	16	7
28	19	473	517	300	1,880	200	607	179	243	64	13	8
29	19	488	473		------	198	547	137	183	60	11	10
30	18	488	430		------	205	502	333	148	61	13	9
31	18	------	402		------	2,830	------	3,000	------	61	13	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	54	10	17.1	1,050
November	46,300	25	5,150	306,000
December	5,390	322	1,190	72,200
January	5,600	------	915	56,300
February	5,230	187	698	38,800
March	2,830	198	605	37,200
April	9,410	374	1,860	111,000
May	12,200	137	1,940	119,000
June	4,250	148	1,270	75,600
July	5,610	60	680	41,800
August	473	11	74.5	4,580
September	15	6	9.17	546
The year	46,300	6	1,190	865,000

Digitized by Google

OSAGE RIVER AT TRADING POST, KANS.

LOCATION.—Chain gage in SE. ¼ sec. 5, T. 21 S., R. 25 E., at Trading Post, 1 mile above mouth of Big Sugar Creek.

DRAINAGE AREA.—2,880 square miles.

RECORDS AVAILABLE.—August, 1921, to December, 1923; October, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, about 120,000 second-feet Nov. 18 (gage height, 34.45 feet); minimum, 11 second-feet Sept. 30 (gage height, 1.07 feet).

1921–1923, 1928–29: Maximum discharge, that of Nov. 18, 1929; minimum, 2 second-feet Oct. 29, 1922 (gage height, 0.84 foot).

REMARKS.—Records good except those for Nov. 15 to Feb. 10, and for estimated periods, which are fair. Stage-discharge relation affected by ice Jan. 5–14, 19–30, Feb. 3, and 8–10.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		67	1,620	*966	965	5,600	8,860	1,520	4,220	445	80	24
2		81	1,730	922	725	4,220	10,500	2,900	6,650	445	85	18
3		1,090	1,730	800	670	1,620	9,420	5,120	10,300	415	64	12
4		615	1,270	840	615	1,270	5,960	4,760	14,000	368	62	21
5		368	1,050	922	615	1,140	1,830	2,580	14,900	308	58	41
6		251	880	1,050	615	1,090	1,420	1,830	10,700	236	54	48
7		202	800	1,050	615	1,140	1,180	1,620	4,280	*236	56	38
8		174	725	1,500	600	1,140	1,920	1,420	2,900	1,520	48	31
9		139	688	2,080	550	1,050	3,440	1,220	4,880	922	54	33
10		117	725	10,600	*400	880	2,720	1,090	4,700	1,920	85	157
11	*40	101	688	12,100	445	800	7,520	1,010	1,320	5,420	382	66
12		93	*634	12,400	477	763	7,880	10,900	5,000	7,850	*498	39
13		93	580	12,700	477	1,220	6,600	19,800	2,960	8,590	614	35
14		83	3,860	11,300	415	2,380	5,660	22,100	1,270	5,840	382	35
15		60	6,650	6,950	*430	3,140	4,580	22,800	*1,050	2,000	216	18
16		9,210	7,640	3,320	445	2,720	6,500	23,400	840	1,280	164	23
17		65,800	10,200	2,160	840	2,160	5,780	22,100	725	728	101	21
18		114,000	12,800	2,380	1,620	1,520	1,620	18,700	580	540	70	19
19		113,000	12,800	2,200	1,420	1,220	2,160	19,600	1,620	472	64	18
20		76,100	10,200	2,050	1,220	1,090	6,500	18,200	2,720	382	48	16
21		54,600	6,450	1,900	1,220	965	10,500	9,350	4,340	313	44	14
22		34,700	2,310	1,750	1,010	840	14,500	5,180	2,240	280	38	12
23	210	29,500	1,830	1,600	*1,010	800	16,800	*3,340	7,240	220	38	18
24	148	25,600	1,620	1,450	*1,010	725	18,200	1,520	7,640	194	30	18
25	106	15,600	*1,520	1,300	4,220	650	16,200	1,220	5,300	171	31	14
26	107	7,840	1,420	1,200	4,280	840	9,420	1,180	2,580	143	33	14
27	112	4,940	1,420	1,150	5,660	725	4,520	1,180	1,270	129	30	14
28	76	2,310	1,320	1,100	7,200	*650	2,160	1,620	880	120	29	13
29	65	1,180	1,220	1,050	-------	580	1,830	1,320	763	95	33	*12
30	63	1,270	1,140	1,010	-------	580	1,520	1,050	*604	95	27	11
31	40	-------	1,010	*990	-------	2,160	-------	1,320	-------	75	27	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	-------	-------	58.3	3,580
November	114,000	60	18,600	1,110,000
December	12,800	580	3,180	196,000
January	12,700	800	3,320	204,000
February	7,200	400	1,420	78,900
March	5,600	580	1,470	90,400
April	18,200	1,180	6,590	392,000
May	23,400	1,010	7,450	457,000
June	14,900	580	4,280	255,000
July	8,590	75	1,350	83,000
August	614	27	114	7,010
September	157	11	28.4	1,690
The year	114,000	11	3,980	2,880,000

* Estimated.

Digitized by Google

OSAGE RIVER AT WARSAW, MO.

LOCATION.—Staff gage in NE. ¼ SW. ¼ sec. 17, T. 40 N., R. 22 W., at Warsaw. Zero of gage is 631.54 feet above mean sea level.

DRAINAGE AREA.—11,500 square miles.

RECORDS AVAILABLE.—October, 1925, to September, 1929.

EXTREMES.—Maximum discharge during year, 89,700 second-feet May 19 (gage height, 34.8 feet); minimum, 100 second-feet Sept. 4 and 16–18 (gage height, 1.3 feet).

1925–1929: Maximum discharge, that of May 19, 1929; minimum, 90 second-feet Aug. 12, 1926 (gage height, 1.2 feet).

Maximum stage known, 44.4 feet in June, 1844 (discharge, about 135,000 second-feet).

REMARKS.—Records fair. Gage-height record furnished by United States Weather Bureau.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	330	485	36,900	3,840	3,840	19,800	9,180	25,500	10,600	4,280	580	220
2	330	485	27,500	3,400	3,620	18,400	10,600	22,900	14,900	3,840	580	145
3	330	485	14,900	3,180	3,400	14,000	18,200	29,400	24,300	3,180	580	120
4	270	400	6,040	2,960	3,180	9,180	23,100	29,400	22,200	2,740	485	100
5	1,240	400	4,280	4,940	3,180	6,920	22,700	23,100	23,600	2,540	485	120
6	580	580	3,400	13,100	2,960	6,920	15,600	20,300	27,000	2,340	485	145
7	485	1,000	2,960	21,000	2,740	6,700	8,490	40,700	27,000	2,160	580	220
8	400	1,000	2,340	21,200	2,540	6,040	22,900	49,900	24,100	1,980	485	145
9	330	780	2,160	18,400	2,340	5,600	49,600	43,700	19,100	4,060	485	120
10	330	680	1,800	25,100	2,960	4,940	59,500	39,700	14,500	5,160	1,640	145
11	270	580	1,640	29,400	2,740	4,500	57,500	30,200	10,300	6,260	1,640	145
12	270	485	1,640	27,000	2,740	4,280	54,600	33,400	11,700	9,410	1,120	145
13	270	400	1,800	25,300	2,740	4,280	46,700	54,600	18,400	14,500	1,640	145
14	270	400	2,740	26,000	2,340	4,060	33,600	64,800	15,600	16,100	1,000	120
15	270	400	4,940	25,500	2,160	4,940	26,000	69,900	17,000	15,400	1,000	120
16	330	5,160	5,600	24,600	2,160	22,900	24,100	72,000	17,500	11,700	1,120	100
17	330	15,200	18,600	21,200	3,180	21,500	23,900	73,000	12,200	9,180	1,120	100
18	270	23,400	30,400	17,500	3,620	17,500	21,500	77,100	5,820	6,040	890	100
19	270	30,900	34,400	13,300	3,400	15,400	17,500	89,700	4,500	3,180	680	120
20	270	49,300	30,400	12,400	4,500	11,000	15,400	88,300	8,490	2,540	485	120
21	580	60,200	27,200	12,400	5,820	7,140	31,200	86,200	18,800	1,800	485	120
22	680	63,800	24,300	11,000	5,380	7,360	40,200	84,800	23,400	1,360	400	120
23	890	65,500	20,000	9,640	4,500	5,600	39,400	81,300	31,600	1,240	400	400
24	1,000	66,500	13,100	9,410	3,400	4,940	34,600	73,700	34,200	1,120	400	220
25	1,980	65,900	7,360	8,030	8,490	5,380	39,200	62,500	30,400	1,000	330	180
26	1,800	64,500	5,820	10,100	13,600	9,180	38,900	51,400	34,200	890	270	145
27	1,240	57,200	5,380	8,490	16,300	12,400	36,200	40,200	33,900	780	220	120
28	890	53,000	4,940	6,480	17,900	10,800	35,200	28,900	21,700	780	220	120
29	680	49,000	4,720	5,600	-------	8,950	32,600	16,500	4,500	680	220	180
30	580	43,900	4,500	4,940	-------	7,140	29,200	12,200	5,380	680	270	190
31	485	-------	4,280	4,720	-------	6,260	-------	11,900	-------	580	270	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,980	270	589	0.051	0.06
November	66,500	400	24,100	2.10	2.34
December	36,900	1,640	11,500	1.00	1.15
January	29,400	2,960	13,900	1.21	1.40
February	17,900	2,160	4,850	.422	.44
March	22,900	4,060	9,480	.824	.95
April	59,500	9,180	30,600	2.66	2.97
May	89,700	11,900	49,300	4.29	4.95
June	34,200	4,500	18,900	1.64	1.83
July	16,100	580	4,440	.386	.44
August	1,640	220	660	.057	.06
September	400	100	149	.013	.01
The year	89,700	100	14,100	1.23	16.62

Digitized by Google

OSAGE RIVER NEAR BAGNELL, MO.

LOCATION.—Staff gage in N. ½ SE. ¼ sec. 21, T. 40 N., R. 15 W., 1½ miles above Bagnell. Zero of gage is 549.75 feet above mean sea level.
DRAINAGE AREA.—14,000 square miles.
RECORDS AVAILABLE.—May, 1925, to September, 1929.
EXTREMES.—Maximum discharge during year, 106,000 second-feet May 21 (gage height, 36.6 feet); minimum, 610 second-feet Sept. 19 (gage height, 4.71 feet).
1925–1929: Maximum discharge, 106,000 second-feet Apr. 17, 1927, and May 21, 1929 (gage height. 36.6 feet); minimum, 324 second-feet Sept. 10–12, 1925.
Maximum stage known, 43.1 feet in June, 1844 (discharge, about 150,000 second-feet).
REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,010	1,250	48,500	4,770	5,500	21,100	9,380	31,600	15,200	6,760	1,300	735
2	965	1,200	39,300	4,530	5,010	21,700	12,200	36,600	14,600	5,500	1,360	735
3	965	1,150	27,600	4,050	4,530	19,800	14,600	44,700	28,600	4,770	1,300	770
4	965	1,100	14,300	3,810	4,050	15,200	22,100	41,000	33,500	4,290	1,250	735
5	1,010	1,100	8,320	4,530	4,290	11,100	25,300	35,900	26,900	3,810	1,360	735
6	1,060	1,060	4,770	10,200	4,050	9,100	23,300	34,200	28,300	3,580	1,300	735
7	1,420	1,060	4,050	17,000	3,810	9,100	16,100	50,900	30,200	3,810	1,300	702
8	1,200	1,150	3,580	24,000	3,580	8,580	15,200	61,700	29,900	3,350	1,300	735
9	1,100	1,420	3,120	22,400	3,350	7,540	49,800	63,100	26,600	3,120	1,820	805
10	1,010	1,540	2,790	24,000	2,580	6,760	67,400	56,800	22,400	3,580	3,810	805
11	965	1,360	2,580	30,200	2,790	6,000	73,500	48,500	16,700	5,750	3,810	770
12	922	1,250	2,370	32,600	2,900	6,000	71,700	37,900	13,100	7,540	3,810	735
13	880	1,150	2,470	29,600	2,900	5,500	67,000	51,200	17,900	11,600	2,470	702
14	880	1,150	2,680	27,600	2,900	5,250	57,800	69,500	21,100	15,800	2,580	702
15	842	1,060	3,810	28,300	2,900	6,250	41,300	75,600	18,200	17,000	2,370	702
16	842	1,250	4,530	28,300	2,790	20,800	30,200	77,800	19,500	15,800	1,990	670
17	842	13,400	8,840	25,600	2,790	31,900	27,600	78,600	18,200	12,500	1,990	670
18	965	21,100	25,600	22,400	3,350	26,600	26,300	84,900	12,800	9,660	1,990	640
19	1,010	26,000	35,200	19,800	4,050	21,100	23,300	96,400	7,540	6,760	1,900	610
20	965	34,200	36,900	14,900	3,810	17,600	19,200	104,000	6,000	5,010	1,670	770
21	922	48,500	33,200	14,000	5,250	13,100	26,900	106,000	11,900	3,580	1,420	922
22	922	57,200	29,200	14,000	6,000	9,660	41,300	103,000	22,700	2,900	1,200	842
23	1,010	62,400	25,300	12,500	5,500	8,320	45,100	99,600	26,300	2,470	1,150	770
24	1,250	65,200	20,500	11,300	5,010	7,540	44,700	98,000	34,200	2,180	1,100	735
25	1,420	67,000	13,400	11,100	4,770	6,760	46,800	90,800	35,600	1,990	1,060	702
26	1,820	67,700	8,840	11,300	12,500	12,800	47,800	82,700	34,200	1,820	1,010	670
27	2,470	67,700	7,020	11,300	17,300	19,500	44,700	70,200	37,300	1,670	1,010	770
28	2,080	64,200	6,250	10,200	19,800	17,000	41,000	53,000	33,500	1,600	922	805
29	1,670	59,600	5,750	8,060	-------	14,300	39,000	34,200	21,100	1,480	842	702
30	1,480	54,700	5,250	7,020	-------	11,900	35,600	20,100	10,500	1,420	805	670
31	1,300	-------	4,770	6,250	-------	8,580	-------	16,100	-------	1,360	735	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	2,470	842	1,170	0.08	0.09
November	67,700	1,060	24,300	1.74	1.94
December	48,500	2,370	14,200	1.01	1.16
January	32,600	3,810	16,000	1.14	1.31
February	19,800	2,480	5,290	.378	.39
March	31,900	5,250	13,100	.936	1.08
April	73,500	9,380	36,900	2.64	2.94
May	106,000	16,100	63,100	4.51	5.20
June	37,300	6,000	22,500	1.61	1.80
July	17,000	1,360	5,560	.397	.46
August	3,810	735	1,680	.120	.14
September	922	610	735	.05	.06
The year	106,000	610	17,100	1.22	16.57

Digitized by Google

LITTLE OSAGE RIVER AT STOTESBURY, MO.

LOCATION.—Chain gage in NE. ¼ sec. 21, T. 37 N., R. 33 W., at highway bridge half a mile north of Stotesbury.
DRAINAGE AREA.—427 square miles.
RECORDS AVAILABLE.—April to September, 1929.
EXTREMES.—Maximum discharge during period, 13,600 second-feet May 13 (gage height, 28.29 feet); minimum discharge, 0.2 second-foot Sept. 29 and 30; minimum gage height, 1.38 feet September 30.
Maximum stage known, 30.7 feet Oct. 4, 1927 (discharge, about 21,000 second-feet).
REMARKS.—Records fair.

Daily and monthly discharge, in second-feet, 1929.

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	89	199	167	27	6	0.4	16	362	2,330	57	60	14	0.7
2	85	382	960	23	6	.4	17	255	1,280	30	40	11	.6
3	93	474	2,330	20	5	.3	18	231	6,620	18	32	7	.5
4	78	263	1,040	20	5	.3	19	280	10,400	1,580	29	5	.5
5	68	207	208	24	6	.4	20	2,870	5,780	832	26	4	.5
6	60	1,480	199	22	6	.4	21	4,220	1,720	1,500	23	3	.4
7	60	1,460	191	24	5	.4	22	1,750	524	414	20	2	.4
8	1,360	362	183	23	12	.4	23	538	316	215	21	2	.5
9	1,220	289	151	48	7	.3	24	960	263	159	19	1.7	.4
10	3,000	231	135	900	5	.3	25	4,630	215	135	16	.7	.4
11	2,170	199	99	524	12	.3	26	2,330	566	113	13	.6	.4
12	636	12,400	92	382	9	.3	27	678	307	85	10	.6	.3
13	307	10,700	106	239	7	4	28	362	223	66	10	.5	.3
14	247	5,400	92	127	6	3	29	289	207	51	9	.4	.2
15	768	2,600	72	85	15	2	30	231	159	34	7	.4	.2
							31		159		9	.4	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
April	4,630	60	1,010	2.37	2.64
May	12,400	159	2,180	5.11	5.89
June	2,330	18	380	.890	.99
July	900	7	88.1	.206	.24
August	15	.4	5.33	.012	.01
September	4	.2	.65	.0015	.002

Digitized by Google

MARMATON RIVER NEAR FORT SCOTT, KANS.

LOCATION.—Chain gage in NW. ¼ sec. 21, T. 25 S., R. 25 E., 2 miles northeast of Fort Scott and 2½ miles west of Kansas-Missouri State line.

DRAINAGE AREA.—411 square miles.

RECORDS AVAILABLE.—August, 1921, to June, 1925; April to September, 1929.

EXTREMES.—Maximum discharge during year, 24,400 second-feet May 12 (gage height, 37.04 feet); minimum, 1 second-foot Sept. 8–30.

1921–1925, 1929: Maximum discharge, that of May 12, 1929; minimum, 1 second-foot several days in 1922, 1923, and 1929.

Maximum stage known, 42.34 feet in 1915.

REMARKS.—Records good except those for extremely high stages, which are fair. Slight regulation caused by operations at dam at Fort Scott.

Daily and monthly discharge, in second-feet, 1929.

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1		454	98	8	25	2	16	394	3,530	57	57	2	1
2		924	364	8	21	2	17	334	2,620	30	42	2	1
3		394	324	8	18	2	18	434	4,520	14	34	2	1
4		324	282	8	13	2	19	520	10,800	688	25	2	1
5		1,150	238	8	10	2	20	6,200	2,770	1,630	18	2	
6		6,440	204	8	7	2	21	5,300	1,330	937	14	2	
7		2,020	166	8	5	2	22	1,410	748	497	11	2	
8		1,140	154	8	3	1	23	616	344	324	9	2	
9		676	126	131	2	1	24	846	271	204	6	2	
10		304	83	414	2	1	25	4,110	227	126	4	2	1
11		424	58	444	2	1	26	1,490	216	58	2	2	1
12		22,900	43	344	2	1	27	580	192	32	2	2	1
13		10,000	34	260	2	1	28	374	179	20	2	2	1
14		2,440	114	166	2	1	29	293	154	14	29	2	1
15		1,330	83	216	2	1	30	227	126	9	63	2	1
							31		109		32	2	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 16–30	6,200	227	1,540	45,800
May	22,900	109	2,550	157,000
June	1,630	9	234	13,900
July	444	2	77.1	4,740
August	25	2	4.77	293
September	2	1	1.23	73
The period				222,000

Digitized by Google

SAC RIVER NEAR STOCKTON, MO.

LOCATION.—Chain gage in W. ½ sec. 11, T. 34 N., R. 26 W., at bridge on State highway No. 54, 2½ miles east of Stockton.

DRAINAGE AREA.—1,160 square miles.

RECORDS AVAILABLE.—July, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 18,700 second-feet May 19 (gage height, 20.85 feet); minimum, 66 second-feet Sept. 30 (gage height, 2.50 feet).

1921–1929: Maximum discharge, 34,800 second-feet Apr. 1, 1927 (gage height, 24.95 feet); minimum, 25 second-feet Sept. 10, 1925 (gage height, 1.62 feet).

Maximum stage known, 29.3 feet in July, 1909.

REMARKS.—Records fair.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	174	129	129	481	875	1,230	1,710	1,350	1,530	930	*242	108
2	174	129	143	444	875	1,170	1,710	4,930	1,410	870	234	108
3	174	129	138	408	770	1,110	1,710	6,180	1,530	815	234	104
4	174	129	134	390	720	1,050	1,470	3,740	1,290	815	234	101
5	174	129	129	2,250	675	990	1,350	2,550	1,170	760	234	104
6	174	129	124	1,770	675	1,110	1,230	13,300	1,110	710	220	108
7	169	129	119	1,530	675	990	1,170	14,700	990	710	494	135
8	164	129	114	1,350	630	930	7,230	9,640	1,170	660	415	180
9	161	129	110	1,590	*609	875	17,800	8,700	2,740	585	343	144
10	158	129	110	2,800	*588	770	11,500	5,420	1,590	710	279	126
11	156	129	110	2,010	*566	770	5,860	4,160	1,410	1,170	*347	117
12	151	129	105	1,710	*544	770	4,230	5,780	1,290	815	415	104
13	143	158	119	1,110	*523	770	3,320	17,100	1,170	514	326	99
14	134	153	131	1,230	*502	675	3,190	14,700	1,530	474	264	101
15	129	148	126	1,110	481	675	3,060	8,600	1,890	434	206	112
16	126	148	3,670	990	462	1,230	2,610	6,260	1,170	415	180	108
17	202	143	6,820	875	520	1,410	2,130	4,300	*1,050	396	*174	108
18	174	202	3,740	1,470	1,110	1,350	1,770	7,230	930	378	167	108
19	148	216	2,610	1,350	990	1,230	1,590	17,800	870	360	154	101
20	138	202	1,710	990	770	1,110	7,590	11,400	870	343	154	99
21	*154	202	1,290	875	675	990	8,800	6,420	870	326	154	99
22	171	174	1,110	770	562	990	5,420	3,880	1,530	310	149	99
23	158	164	930	770	540	875	3,000	*3,450	2,670	294	144	99
24	153	153	820	675	*525	820	2,670	*3,020	3,600	279	140	78
25	146	119	770	675	1,110	770	2,550	*2,580	8,900	264	130	78
26	138	129	720	770	1,470	1,470	2,430	2,150	2,930	264	135	78
27	138	129	675	1,470	1,650	1,890	2,130	1,960	2,080	264	130	78
28	138	129	630	1,410	1,470	1,710	1,830	1,590	1,530	249	126	76
29	134	129	562	1,110	-------	1,350	1,590	1,230	1,290	234	121	74
30	129	129	520	990	-------	1,410	1,470	1,890	1,110	234	117	66
31	129	-------	481	990	-------	1,710	-------	1,650	-------	249	112	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	202	126	154	0.133	0.15
November	216	119	146	.126	.14
December	6,820	105	932	.803	.93
January	2,800	390	1,170	1.01	1.16
February	1,650	462	770	.664	.69
March	1,890	675	1,100	.948	1.09
April	17,800	1,170	3,800	3.28	3.66
May	17,800	1,230	6,380	5.50	6.34
June	8,900	870	1,770	1.53	1.71
July	1,170	234	511	.441	.51
August	494	112	219	.189	.22
September	180	66	103	.089	.10
The year	17,800	66	1,430	1.23	16.70

* Estimated.

Digitized by Google

LITTLE SAC RIVER NEAR SPRINGFIELD, MO.

LOCATION.—Staff gage in SW. ¼ sec. 26, T. 30 N., R. 22 W., half a mile above South Dry Sac Creek and 6 miles northwest of Springfield. Zero of gage is about 1,162 feet above mean sea level.

DRAINAGE AREA.—40 square miles.

RECORDS AVAILABLE.—May, 1927, to September, 1929.

EXTREMES.—Maximum discharge during year, about 1,630 second-feet May 6; minimum, 0.1 second-foot Sept. 3–5 and 21.

1927–1929: Maximum discharge, 7,000 second-feet June 28, 1928 (gage height, 12.30 feet); minimum, that of Sept. 3–5, and 21, 1929.

REMARKS.—Records fair above 5 second-feet and poor below. Mean discharge estimated Apr. 6–18. Flow regulated after Apr. 5 by storage in McDaniel Lake.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2	4	8	10	26	49	100	14	50	26	7	0.2
2	3	4	8	10	24	43	67	41	56	21	4	.2
3	2	4	7	9	20	42	55	48	30	16	3	.1
4	2	4	7	9	22	50	46	224	35	17	3	.1
5	4	5	7	83	20	48	41	236	34	15	.8	.1
6	3	4	6	55	20	44		725	33	16	7	6
7	3	4	6	38	19	39		260	133	14	11	5
8	4	4	6	31	18	35		388	150	13	7	.8
9	4	4	6	41	17	32		224	75	14	4	.6
10	5	5	6	58	15	30		160	59	14	3	4
11	4	8	5	48	15	28		125	53	11	20	.2
12	3	8	5	39	14	30	85	388	75	10	7	5
13	3	7	10	34	14	28		272	90	10	4	7
14	4	8	11	31	14	26		212	62	9	6	5
15	4	9	10	27	13	41		212	50	8	6	2
16	5	8	24	24	12	83		125	41	8	3	1
17	5	10	130	23	12	68		110	34	9	1	3
18	4	10	58	29	12	55		150	31	8	5	.2
19	4	8	41	40	17	48	21	321	31	13	9	.2
20	4	8	33	36	17	43	31	160	29	4	2	.2
21	3	7	27	33	17	35	39	117	24	4	.3	.1
22	4	7	23	33	17	33	39	103	87	4	.2	.6
23	4	6	20	29	19	31	39	87	53	5	.3	.8
24	3	6	16	62	19	30	39	75	82	5	.8	.7
25	3	6	16	87	37	28	38	72	125	5	4	.2
26	3	5	14	61	94	45	37	66	62	4	2	.2
27	3	6	13	49	73	39	37	110	48	3	3	.5
28	3	6	12	40	61	39	34	96	41	3	6	.8
29	3	9	12	34	------	53	17	77	35	4	2	3
30	2	9	11	32	------	57	15	60	28	7	.2	2
31	2	------	10	29	------	57	------	46	------	7	.8	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	5	2	3.39	0.085	0.10
November	10	4	6.43	.161	.18
December	130	5	18.3	.458	.53
January	87	9	37.5	.938	1.08
February	94	12	24.2	.605	.63
March	83	26	42.2	1.06	1.22
April	100	15	60.0	1.50	1.67
May	725	14	171	4.28	4.93
June	150	24	57.9	1.45	1.62
July	26	3	9.90	.248	.29
August	20	.2	4.27	.107	.12
September	7	.1	1.66	.041	.05
The year	725	.1	36.6	.915	12.42

Digitized by Google

SOUTH GRAND RIVER NEAR BROWNINGTON, MO.

LOCATION.—Chain gage in NW. ¼ sec. 17, T. 40 N., R. 25 W., at highway bridge 500 feet below Deepwater Creek and 1 mile north of Brownington. Zero of gage is about 686.5 feet above mean sea level. Chain gage at railroad bridge 200 feet upstream used Nov. 24, 1928, to Jan. 16, 1929.

DRAINAGE AREA.—1,660 square miles.

RECORDS AVAILABLE.—June, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 40,000 second-feet Nov. 19 (gage height, from high-water mark, 39.9 feet); minimum, 2 second-feet Sept. 25–30. 1921–1929: Maximum discharge, that of Nov. 19, 1928; minimum, 0.5 second-foot several days during September, 1925.

REMARKS.—Records fair except those above 30,000 second-feet, which are poor. Discharge estimated Nov. 20–22.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	40	416	306	436	5,740	2,760	550	2,320	290	28	7
2	13	39	305	290	416	3,360	4,780	1,990	2,160	233	26	6
3	13	44	376	196	260	1,220	8,740	2,100	4,840	208	26	5
4	12	322	322	274	220	875	7,780	2,100	6,940	164	25	4
5	118	260	290	675	220	1,440	4,660	1,080	9,910	208	19	174
6	54	154	246	3,420	208	1,120	1,080	2,480	9,340	145	19	81
7	30	110	220	2,920	208	1,020	600	1,990	6,820	118	55	42
8	18	81	174	3,090	208	825	19,800	1,080	3,310	1,500	28	110
9	10	69	174	3,420	196	625	9,700	875	1,280	2,760	23	81
10	6	38	174	5,500	196	480	20,000	525	775	2,920	21	69
11	6	32	174	4,540	164	357	8,320	436	480	3,640	25	36
12	5	44	174	4,720	136	260	7,540	9,980	395	3,920	19	30
13	5	44	376	6,460	127	502	6,520	16,900	5,320	4,780	19	21
14	3	43	1,220	6,220	127	1,120	3,040	19,300	5,860	4,660	47	17
15	3	42	1,770	3,800	136	1,330	1,220	19,000	8,140	1,550	39	15
16	11	5,320	1,220	1,440	164	6,100	1,380	15,600	6,640	502	30	12
17	17	8,500	6,100	875	525	4,600	1,180	11,700	2,320	274	22	9
18	56	16,200	6,580	1,330	1,220	5,680	725	11,700	525	196	17	7
19	340	38,800	6,100	2,600	1,500	4,540	525	12,100	1,220	174	14	6
20	233	33,600	6,700	2,650	1,120	1,500	2,870	14,400	5,020	145	8	5
21	136	27,700	4,360	2,210	775	875	4,300	12,600	8,920	127	10	10
22	174	22,100	1,600	1,220	600	675	3,750	10,100	10,500	110	9	6
23	322	17,000	1,380	2,160	357	550	4,140	6,820	11,300	88	8	5
24	975	12,000	825	2,380	233	436	3,310	875	11,300	75	7	3
25	775	8,620	575	2,760	2,650	357	5,980	725	11,400	75	6	2
26	260	825	550	2,870	4,960	1,330	5,380	436	9,980	55	5	2
27	127	480	525	1,660	3,530	575	5,620	416	7,300	52	5	2
28	88	458	502	775	5,140	436	3,970	395	2,480	44	5	2
29	64	416	436	550	-------	376	1,280	395	775	28	6	2
30	52	416	416	357	-------	322	725	725	376	36	6	2
31	42	-------	340	290	-------	306	-------	1,220	-------	34	7	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	975	3	128	0.077	0.09
November	38,800	32	6,460	3.89	4.34
December	6,700	174	1,440	.867	1.00
January	6,460	196	2,320	1.40	1.61
February	5,140	127	930	.560	.58
March	6,100	260	1,580	.952	1.10
April	20,000	525	5,060	3.05	3.40
May	19,300	416	5,830	3.51	4.05
June	11,400	376	5,260	3.17	3.54
July	4,780	28	939	.566	.65
August	55	5	18.9	.011	.01
September	174	2	25.8	.016	.02
The year	38,800	2	2,490	1.50	20.39

Digitized by Google

NIANGUA RIVER NEAR ROACH, MO.

LOCATION.—Staff gage in SW. ¼ sec. 20, T. 38 N., R. 17 W., at bridge on State highway No. 54, 4 miles northeast of Roach. Zero of gage is 615.15 feet above mean sea level.

DRAINAGE AREA.—698 square miles.

RECORDS AVAILABLE.—November, 1922, to September, 1929.

EXTREMES.—Maximum discharge during year, 15,900 second-feet May 7 (gage height, 13.12 feet); minimum discharge, 300 second-feet Oct. 7, 9–21, 25–31, and Nov. 1; minimum gage height, 1.75 feet Sept. 30.

1922–1929: Maximum discharge, 27,200 second-feet Aug. 9, 1927 (gage height, 17.00 feet); minimum, 160 second-feet Aug. 26 to Sept. 2, 1923.

Maximum stage known, 23.8 feet in September, 1914.

REMARKS.—Records good below 4,000 second-feet and fair above.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	320	300	320	400	550	1,180	1,040	708	1,380	680	452	362
2	320	320	320	380	525	980	1,110	1,240	1,380	652	452	362
3	320	340	320	380	525	855	1,530	3,030	1,610	600	430	340
4	340	340	340	385	500	795	1,310	4,280	1,610	575	708	340
5	320	340	340	452	475	765	1,110	2,330	1,380	550	550	340
6	320	340	340	625	475	855	980	4,500	1,110	550	475	362
7	300	320	320	708	452	855	855	14,800	1,040	550	430	362
8	320	320	320	795	452	765	1,180	15,600	1,110	525	525	385
9	300	320	320	680	452	708	5,720	4,060	1,530	500	2,010	408
10	300	320	320	795	452	680	8,320	4,610	1,850	525	3,220	385
11	300	320	320	980	430	625	4,720	2,850	1,240	550	1,310	362
12	300	320	320	1,040	430	600	2,850	2,330	1,110	550	430	340
13	300	320	340	855	430	575	2,090	3,950	1,040	525	1,180	362
14	300	320	380	652	408	575	1,690	6,680	915	652	1,450	362
15	300	320	360	600	408	600	1,450	4,720	915	600	680	340
16	300	340	360	550	430	1,610	1,380	3,420	855	550	600	340
17	300	340	550	550	408	2,250	1,240	2,500	795	500	550	362
18	300	360	760	550	408	1,930	1,180	2,330	765	500	525	340
19	300	360	1,690	550	408	1,530	1,040	6,200	708	475	475	340
20	300	360	1,080	855	408	1,180	980	7,080	735	452	475	340
21	300	340	760	765	408	980	2,090	4,610	708	452	452	362
22	320	340	650	735	475	915	1,850	3,120	708	430	430	340
23	320	340	575	680	475	855	1,450	1,930	680	430	430	385
24	320	320	525	652	452	765	1,180	1,770	708	430	430	408
25	300	320	500	625	475	708	1,110	1,690	980	430	408	362
26	300	320	475	652	625	2,010	1,040	1,530	1,110	408	430	340
27	300	320	450	855	1,240	1,450	980	1,380	1,310	408	408	340
28	300	320	425	795	1,530	1,850	855	1,690	915	408	408	340
29	300	320	400	680	-------	1,380	795	2,250	795	385	385	320
30	300	320	400	625	-------	1,180	735	1,850	735	385	385	320
31	300	-------	400	600	-------	1,040	-------	1,690	-------	385	362	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	340	300	307	0.440	0.51
November	360	300	329	.471	.53
December	1,690	320	483	.692	.80
January	1,040	380	660	.946	1.09
February	1,530	408	525	.752	.78
March	2,250	575	1,070	1.53	1.76
April	8,320	735	1,800	2.58	2.88
May	15,600	708	3,890	5.57	6.42
June	1,850	680	1,060	1.52	1.70
July	680	385	504	.722	.83
August	3,220	362	692	.991	1.14
September	408	320	355	.509	.57
The year	15,600	300	977	1.40	19.01

Digitized by Google

BENNETT SPRING AT BRICE, MO.

LOCATION.—Staff gage in sec. 1, T. 34 N., R. 18 W., at Brice.
RECORDS AVAILABLE.—October, 1928, to September, 1929.
EXTREMES.—Maximum gage height during year, 4.35 feet May 6 (discharge not determined); minimum discharge, 133 second-feet Oct. 17, Nov. 21–24, Dec. 4–6, and Sept. 24–30; minimum gage height, 0.84 feet July 10 and 11. Maximum stage known, about 7 feet during June, 1928.
REMARKS.—Records poor prior to May 5 and fair thereafter. Discharge during high stages includes surface water from valley above spring.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-------	160	146	149	149	172	292	350	305	176	152	143
2	-------	160	140	149	136	172	292	335	280	176	160	143
3	-------	160	140	143	136	172	280	320	255	176	152	143
4	-------	160	133	143	136	172	267	320	232	176	152	140
5	-------	160	133	136	136	172	267	320	222	176	152	140
6	-------	160	133	136	136	164	242	1,050	222	176	146	140
7	-------	168	140	136	136	164	280	860	222	168	152	140
8	-------	160	140	172	136	164	292	624	232	172	160	140
9	-------	160	146	172	136	164	740	523	232	164	320	140
10	-------	160	146	172	136	164	475	499	222	156	280	140
11	-------	160	146	172	136	164	399	399	222	156	267	140
12	-------	160	146	172	136	164	380	365	212	188	232	140
13	-------	168	152	172	136	217	380	624	202	176	222	140
14	-------	168	152	172	136	274	380	770	202	168	202	140
15	-------	168	152	172	136	274	380	571	212	168	192	140
16	-------	152	152	172	136	274	350	475	212	168	184	140
17	133	149	160	172	136	274	320	399	202	168	176	140
18	136	149	168	172	136	242	305	380	202	168	168	140
19	136	156	172	172	136	197	305	954	202	168	160	140
20	140	156	164	172	136	180	292	770	202	168	160	140
21	140	133	164	172	136	180	292	624	202	152	160	140
22	140	133	164	172	136	184	280	523	202	152	160	140
23	140	133	156	172	136	172	267	437	212	152	160	140
24	146	133	156	172	149	176	255	399	212	152	160	133
25	146	140	149	172	180	176	255	365	202	152	160	133
26	152	140	149	172	172	176	242	320	192	152	152	133
27	160	140	149	164	172	222	232	280	184	152	152	133
28	160	140	143	164	172	242	232	365	176	168	149	133
29	160	140	143	156	-------	280	232	320	176	160	143	133
30	152	140	143	149	-------	292	232	280	168	160	143	133
31	152	-------	143	149	-------	292	-------	292	-------	160	143	-------

Month	Maximum	Minimum	Mean	Month	Maximum	Minimum	Mean
October 17–31	160	133	146	April	740	232	315
November	168	133	152	May	1,050	280	488
December	172	133	149	June	305	168	214
January	172	136	163	July	188	152	165
February	180	136	142	August	320	143	176
March	292	164	204	September	143	133	139

Digitized by Google

GASCONADE RIVER BASIN

GASCONADE RIVER NEAR HAZLEGREEN, MO.

LOCATION.—Chain gage in SE. ¼ SE. ¼ sec. 15, T. 35 N., R. 14 W., at bridge on State Highway No. 66, 1 mile below Osage Fork and 1½ miles west of Hazlegreen.

DRAINAGE AREA.—1,250 square miles.

RECORDS AVAILABLE.—April to September, 1929.

EXTREMES.—Maximum discharge during period, 19,000 second-feet May 7 (gage height, 16.21 feet); minimum, 98 second-feet Sept. 4 (gage height, 1.66 feet).

Maximum stage known, 31.8 feet in January, 1916.

REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1929

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	2,010	680	1,050	470	500	120	16	3,900	4,500	1,660	380	440	182
2	2,490	1,240	985	470	500	110	17	2,740	3,300	1,180	325	380	182
3	1,940	2,740	800	410	500	110	18	2,090	5,000	920	303	320	160
4	1,590	3,010	740	380	320	101	19	1,800	7,400	985	276	292	150
5	1,310	2,090	680	352	248	120	20	1,520	5,320	800	259	264	140
6	1,180	12,500	620	380	204	150	21	1,590	3,300	680	226	248	140
7	1,050	17,100	740	320	237	135	22	1,590	2,490	590	210	259	140
8	4,100	7,400	920	303	770	120	23	1,380	2,010	560	188	198	130
9	11,300	8,380	1,450	314	3,010	130	24	1,120	1,660	1,520	182	237	120
10	15,200	6,100	1,240	314	860	130	25	1,120	1,450	1,450	176	171	120
11	7,680	3,800	920	440	985	130	26	1,050	1,310	1,120	171	160	110
12	4,100	3,300	770	985	1,450	140	27	920	1,240	800	171	150	110
13	2,830	8,100	1,120	590	1,050	160	28	860	1,660	650	160	145	104
14	2,250	12,900	3,800	470	740	160	29	770	2,010	560	150	130	104
15	2,330	7,820	1,870	440	560	160	30	710	1,520	530	182	130	101
							31		1,180		140	120	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
April	15,200	710	2,820	2.26	2.52
May	17,100	680	4,600	3.68	4.24
June	3,800	530	1,060	.848	.95
July	985	140	327	.262	.30
August	3,010	120	502	.402	.46
September	182	101	132	.106	.12

Digitized by Google

GASCONADE RIVER NEAR WAYNESVILLE, MO.

LOCATION.—Chain gage in SE. ¼ sec. 3, T. 36 N., R. 12 W., at bridge on State Highway No. 17, 4 miles north of Waynesville. Zero of gage is 739.34 feet above mean sea level.

DRAINAGE AREA.—1,680 square miles.

RECORDS AVAILABLE.—June, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 21,400 second-feet May 7 (gage height, 15.35 feet); minimum, 141 second-feet Nov. 2 (gage height, 2.26 feet).

1921–1929: Maximum discharge, 27,300 second-feet June 10, 1928 (gage height, 18.20 feet); minimum, 77 second-feet Sept. 27, 1922.

Maximum stage known, 25 feet Aug. 22, 1915.

REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1928–29.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1	176	147	246	430	1,060	2,780	3,040	980	1,480	718	246	198
2	179	141	455	405	1,140	2,260	3,170	1,390	1,390	662	540	186
3	190	161	570	382	905	1,840	3,040	2,520	1,220	600	405	186
4	190	147	482	382	830	1,650	2,520	4,420	1,060	540	570	176
5	198	151	455	360	718	1,740	2,140	3,440	1,020	510	382	183
6	186	158	405	405	662	1,650	1,740	11,100	942	482	360	186
7	198	179	382	540	630	1,650	1,560	20,000	905	760	315	176
8	198	234	382	630	600	1,390	3,300	16,800	942	455	315	183
9	190	222	430	1,060	540	1,140	11,700	9,700	1,140	405	1,300	186
10	198	206	405	980	482	1,060	17,200	10,700	1,560	405	2,030	202
11	202	198	382	942	455	1,060	15,100	6,100	1,300	430	980	168
12	190	190	360	980	510	980	6,820	4,420	1,140	600	1,140	194
13	190	198	360	942	510	868	6,460	10,900	980	905	1,840	218
14	183	198	338	830	455	868	3,580	14,900	1,390	662	1,140	210
15	198	198	338	760	455	1,020	2,910	13,700	3,170	570	830	222
16	183	222	360	718	455	8,700	3,580	8,100	2,140	540	662	222
17	190	230	630	662	430	9,500	4,280	4,860	1,650	482	570	210
18	186	262	1,060	600	455	5,380	3,170	6,820	1,300	405	482	242
19	198	338	2,140	695	455	3,580	2,520	12,100	1,140	360	405	218
20	194	338	1,930	718	455	2,910	2,260	8,900	1,220	338	382	238
21	190	315	1,480	1,390	600	2,390	2,030	5,380	1,020	315	338	238
22	198	388	1,220	1,140	630	2,030	1,930	3,720	905	315	315	222
23	202	315	1,020	1,060	662	1,650	1,840	2,910	760	302	315	206
24	190	310	830	1,480	600	1,480	1,740	2,390	1,220	279	292	202
25	194	288	760	2,650	695	1,390	1,560	2,030	2,780	258	288	206
26	190	279	630	3,170	1,480	1,930	1,390	1,840	1,840	270	238	198
27	198	270	600	4,700	3,720	2,140	1,300	1,740	1,390	262	234	190
28	206	302	570	2,520	4,420	1,930	1,220	2,030	1,140	254	222	183
29	198	274	510	1,930	-------	1,560	1,140	2,390	905	246	214	176
30	202	230	482	1,560	-------	1,480	1,020	2,140	795	360	202	183
31	202	-------	455	1,300	-------	1,390	-------	1,840	-------	234	190	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	206	176	193	0.115	0.13
November	388	141	236	.140	.16
December	2,140	246	667	.397	.46
January	4,700	360	1,170	.696	.80
February	4,420	430	904	.538	.55
March	9,500	868	2,300	1.37	1.58
April	17,200	1,020	3,840	2.29	2.56
May	20,000	980	6,460	3.85	4.44
June	3,170	760	1,330	.792	.88
July	905	234	449	.267	.31
August	2,030	190	572	.340	.39
September	242	168	200	.119	.13
The year	20,000	141	1,530	.911	12.39

Digitized by Google

GASCONADE RIVER AT JEROME, MO.

LOCATION.—Staff gage in S. ½ sec. 13, T. 37 N., R. 10 W., at Jerome, half a mile below Little Piney Creek. Zero of gage is 658.12 feet above mean sea level. Prior to Nov. 20, 1928, staff gage 400 feet downstream was used.

DRAINAGE AREA.—2,840 square miles.

RECORDS AVAILABLE.—April, 1903, to July, 1906; January, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, 32,700 second-feet May 7 (gage height, 16.60 feet); minimum, 680 second-feet several days during October, November, and September.

1903–1906, 1923–1929: Maximum discharge, 51,800 second-feet June 10, 1928 (gage height, 23.25 feet); minimum, 300 second-feet June 15, 1905. Maximum stage known, about 31 feet Jan. 5, 1897.

REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1928–29.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	680	720	1,100	1,050	2,160	4,980	3,940	2,040	3,020	1,800	850	720
2	680	720	1,100	1,000	1,920	3,940	4,820	3,540	5,140	1,680	1,000	680
3	680	680	1,000	950	1,800	3,280	4,820	4,820	5,140	1,570	1,050	680
4	680	720	1,200	950	1,680	3,150	4,080	5,940	3,020	1,460	1,100	680
5	680	720	1,150	1,000	1,680	2,890	3,540	5,780	2,520	1,350	1,100	720
6	680	720	1,100	1,050	1,460	2,890	3,020	17,500	2,280	1,350	950	720
7	680	680	1,150	1,350	1,350	2,640	2,760	31,300	2,640	1,250	950	720
8	680	680	1,050	1,460	1,350	2,400	4,980	26,200	2,640	1,250	950	720
9	680	680	1,100	1,920	1,250	2,160	14,800	20,000	2,400	1,200	1,570	720
10	680	680	1,050	1,920	1,250	1,920	23,800	15,200	2,760	1,200	3,670	720
11	680	680	1,000	1,800	1,200	1,800	24,600	11,800	2,760	1,250	3,020	680
12	680	680	950	1,800	1,150	1,800	14,300	8,500	2,400	1,250	3,800	760
13	680	680	1,000	1,800	1,150	1,680	8,500	15,000	2,890	1,800	2,890	805
14	680	680	950	1,680	1,150	1,680	6,460	22,100	5,620	1,570	2,520	805
15	680	680	1,100	1,570	1,100	4,820	6,640	22,100	6,100	1,460	1,920	805
16	760	680	1,250	1,460	1,100	14,500	9,120	15,000	5,140	1,350	1,570	760
17	720	720	1,350	1,350	1,050	12,400	8,100	9,340	3,670	1,460	1,350	760
18	720	680	1,800	1,350	1,100	10,000	6,280	9,560	3,020	1,200	1,200	760
19	680	720	2,760	1,460	1,150	6,460	4,980	16,200	2,640	1,150	1,100	720
20	680	805	3,540	1,460	1,250	4,980	4,220	12,900	2,400	1,100	1,050	760
21	680	850	2,640	1,800	1,250	4,080	3,940	9,560	2,280	1,050	1,000	720
22	680	850	2,280	2,040	1,350	3,540	3,800	6,820	2,040	1,000	950	720
23	680	850	1,920	2,040	1,350	3,150	3,540	5,460	1,920	950	900	720
24	680	850	1,680	1,920	1,350	2,760	3,280	4,500	3,150	950	850	680
25	680	805	1,570	2,160	1,460	2,520	3,020	3,940	4,980	900	850	680
26	680	805	1,460	5,620	2,280	4,080	2,760	3,540	3,800	900	805	680
27	680	760	1,350	7,360	4,980	3,800	2,520	3,540	2,890	850	760	680
28	680	760	1,250	4,500	7,180	3,280	2,400	4,080	2,520	850	760	680
29	680	805	1,150	3,410	------	2,890	2,280	3,670	2,160	850	760	680
30	680	805	1,100	2,890	------	2,640	2,040	3,940	1,920	900	720	680
31	680	------	1,100	2,400	------	2,640	------	3,540	------	900	720	------

Month	Maximum	Minimum	Mean	Per square miles	Run-off in inches
October	760	680	685	0.241	0.28
November	850	680	738	.260	.29
December	3,540	950	1,430	.504	.58
January	7,360	950	2,080	.732	.84
February	7,180	1,050	1,730	.609	.63
March	14,500	1,680	4,060	1.43	1.65
April	24,600	2,040	6,440	2.27	2.53
May	31,300	2,040	10,600	3.73	4.30
June	6,100	1,920	3,200	1.13	1.26
July	1,800	850	1,220	.430	.50
August	3,800	720	1,380	.486	.56
September	805	680	720	.254	.28
The year	31,300	680	2,860	1.01	13.70

Digitized by Google

GASCONADE RIVER NEAR RICH FOUNTAIN, MO.

LOCATION.—Chain gage in SE. ¼ sec. 16, T. 42 N., R. 8 W., at bridge on Belle-Rich Fountain Road just above Swan Creek and 4 miles east of Rich Fountain. Zero of gage is 554.24 feet above mean sea level.

DRAINAGE AREA.—3,180 square miles.

RECORDS AVAILABLE.—October, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 27,900 second-feet May 9 (gage height, 17.15 feet); minimum, 689 second-feet Oct. 16.

1921–1929: Maximum discharge, 51,000 second-feet June 11, 1928 (gage height, 22.83 feet); minimum, 410 second-feet Sept. 29 and 30, 1922.

REMARKS.—Records good except those for August, which are fair. Discharge estimated Oct. 1–3, 7, 14, 23, 30, 31, July 30, and Sept. 3.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	710	710	832	1,050	2,720	6,710	4,730	2,260	3,820	1,960	860	780
2	710	750	1,230	1,000	2,480	4,730	5,250	4,990	7,990	1,780	860	710
3	710	750	1,140	1,000	2,370	3,950	5,520	6,400	5,520	1,690	980	728
4	710	710	1,100	960	1,930	3,560	5,250	5,660	4,990	1,600	1,020	745
5	710	710	1,230	1,320	1,820	3,440	4,470	9,000	3,440	1,520	980	820
6	710	710	1,230	1,420	1,720	3,440	4,080	14,100	2,840	1,430	940	820
7	710	710	1,100	1,230	1,620	3,200	3,440	22,600	4,210	1,960	940	780
8	710	710	1,140	1,230	1,520	2,960	6,100	27,700	3,820	1,870	940	780
9	710	710	1,140	1,620	1,420	2,720	10,100	26,000	3,200	1,340	1,520	745
10	710	710	1,140	2,150	1,320	2,370	19,200	18,800	2,720	1,260	1,780	780
11	710	710	1,100	2,150	1,420	2,150	23,300	15,300	3,080	1,260	3,690	745
12	710	710	1,050	1,930	1,720	2,150	23,300	14,500	3,560	1,430	2,840	780
13	710	710	1,100	1,930	1,420	2,260	13,400	15,300	3,080	1,340	3,440	900
14	710	710	1,050	1,820	1,140	2,150	7,990	17,600	3,440	1,180	2,840	860
15	710	710	1,000	1,820	1,140	6,400	5,520	21,700	5,120	1,870	2,270	860
16	710	750	1,230	1,720	1,140	15,600	8,660	17,400	7,670	1,430	1,870	860
17	750	832	1,620	1,620	1,100	15,100	9,180	12,100	4,860	1,430	1,520	820
18	750	832	1,520	1,420	1,100	12,600	7,670	14,500	3,690	1,430	1,430	780
19	750	875	2,150	1,820	1,100	9,360	6,100	17,800	3,200	1,260	1,260	745
20	710	832	2,370	1,520	1,230	7,030	5,380	17,000	2,720	1,180	1,180	860
21	710	875	2,720	1,720	1,320	5,380	5,380	13,000	2,720	1,100	1,180	860
22	710	875	2,600	2,040	1,320	4,470	4,730	10,800	2,380	1,020	1,100	820
23	710	875	2,260	2,260	1,420	3,950	4,340	6,710	2,160	1,020	1,020	820
24	710	875	2,040	2,600	1,520	3,440	3,950	5,380	2,490	980	980	780
25	710	875	1,820	3,080	1,820	3,200	3,690	4,860	4,340	980	940	745
26	710	832	1,620	4,210	2,480	8,660	3,320	6,550	6,100	940	900	745
27	710	832	1,520	5,950	3,080	5,250	3,080	5,250	3,690	900	1,180	745
28	710	790	1,420	7,030	5,660	4,470	2,840	4,600	2,960	860	860	745
29	710	790	1,230	4,340	-------	3,820	2,720	4,600	2,490	860	820	710
30	710	832	1,230	3,690	-------	3,560	2,480	4,080	2,160	860	820	710
31	710	-------	1,140	3,080	-------	2,960	--------	4,210	-------	860	780	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	750	710	714	0.225	0.26
November	875	710	777	.244	.27
December	2,720	832	1,450	.456	.53
January	7,030	960	2,280	.717	.83
February	5,660	1,100	1,790	.563	.59
March	15,600	2,150	5,190	1.63	1.88
April	23,300	2,480	7,170	2.25	2.51
May	27,700	2,260	12,000	3.77	4.35
June	7,990	2,160	3,810	1.20	1.34
July	1,960	860	1,310	.412	.48
August	3,690	780	1,410	.443	.51
September	900	710	786	.247	.28
The year	27,700	710	3,230	1.02	13.83

Digitized by Google

PINEY CREEK NEAR BIG PINEY, MO.

LOCATION.—Chain gage in NE. ¼ sec. 8, T. 34 N., R. 10 W., at Ross highway bridge 3 miles east of Big Piney.
DRAINAGE AREA.—560 square miles.
RECORDS AVAILABLE.—October, 1921, to September, 1929.
EXTREMES.—Maximum discharge during year, 8,100 second-feet May 6 (gage height, 10.66 feet); minimum, 138 second-feet Sept. 26 and 29 (gage height, 1.90 feet).
1921–1929: Maximum discharge, 15,200 second-feet June 9, 1928 (gage height, 16.30 feet); minimum, 76 second-feet July 30 and 31, 1926 (gage height, 1.60 feet).
REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	192	192	750	240	440	950	600	330	465	292	181	175
2	192	192	415	240	392	750	690	630	440	330	175	164
3	192	192	392	240	370	660	570	1,400	392	311	164	175
4	195	195	330	257	350	600	542	1,020	392	292	181	159
5	189	195	370	257	311	542	515	810	311	257	186	186
6	189	195	440	350	311	415	490	7,190	292	274	175	192
7	192	195	370	515	292	465	440	4,440	330	257	240	181
8	198	192	330	465	330	370	1,480	2,700	330	240	224	175
9	198	202	292	465	292	370	7,300	5,100	415	224	570	159
10	192	202	292	440	292	350	6,860	2,240	350	240	1,880	164
11	181	192	274	440	274	330	3,000	1,800	330	257	950	154
12	181	189	257	415	274	350	1,880	1,560	311	350	1,560	181
13	181	189	292	311	240	350	1,400	6,860	750	292	570	224
14	181	189	292	311	257	370	1,160	3,900	1,720	257	465	224
15	181	189	570	311	257	2,330	4,550	2,700	3,400	257	350	164
16	192	189	515	311	257	5,870	2,510	1,800	1,160	392	292	170
17	198	195	490	311	240	2,060	1,720	1,560	880	257	292	164
18	198	205	1,090	330	240	1,560	1,240	1,240	630	240	224	170
19	192	205	750	350	330	1,090	1,090	1,320	542	198	224	154
20	192	257	690	542	311	950	950	1,160	465	224	224	164
21	186	224	630	570	292	810	880	1,020	440	170	198	154
22	189	214	415	490	330	750	810	750	392	164	181	170
23	189	205	415	465	330	690	690	660	392	205	186	154
24	189	202	350	440	311	600	660	630	950	192	181	159
25	189	205	330	5,870	330	515	630	660	690	175	192	154
26	189	205	292	1,640	2,800	515	570	600	465	170	186	138
27	198	205	274	1,160	2,600	490	515	660	392	164	181	148
28	195	205	257	720	1,240	465	330	720	350	186	192	148
29	192	211	257	660	-------	440	415	630	311	164	164	138
30	192	810	240	600	-------	415	415	490	274	198	181	143
31	192	-------	240	515	-------	440	-------	490	-------	186	170	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	198	181	190	0.339	0.39
November	810	189	221	.395	.44
December	1,090	240	416	.743	.86
January	5,870	240	653	1.17	1.35
February	2,800	240	510	.911	.95
March	5,870	330	867	1.55	1.79
April	7,300	330	1,500	2.68	2.99
May	7,190	330	1,840	3.29	3.79
June	3,400	274	619	1.11	1.24
July	330	164	239	.427	.49
August	1,880	164	359	.641	.74
September	224	138	167	.298	.33
The year	7,300	138	633	1.13	15.36

Digitized by Google

LITTLE PINEY CREEK AT NEWBURG, MO.

LOCATION.—Chain gage in SE. ¼ sec. 22, T. 37 N., R. 9 W., at highway bridge in Newburg. Zero of gage is 696.99 feet above mean sea level.
DRAINAGE AREA.—200 square miles.
RECORDS AVAILABLE.—October, 1928, to September, 1929.
EXTREMES.—Maximum discharge during period, 8,860 second-feet May 6 (gage height, 7.22 feet); minimum, 58 second-feet Sept. 27–30 (gage height, 1.24 feet).
Maximum stage known, 13.7 feet Aug. 20, 1915.
REMARKS.—Records good. Discharge estimated Aug. 8–10.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	------	79	71	72	86	123	612	115	166	145	77	63
2	------	74	71	77	80	104	351	940	785	145	74	63
3	------	71	69	69	79	120	262	425	750	128	76	63
4	------	69	72	71	79	185	217	310	395	123	74	63
5	------	71	72	97	77	148	230	257	315	115	72	66
6	------	71	72	106	82	131	162	7,420	252	115	72	66
7	------	71	68	79	76	109	148	900	455	112	72	66
8	------	71	69	72	76	99	860	680	373	109	80	63
9	------	71	69	84	79	93	985	548	257	99	100	61
10	------	71	69	80	77	79	715	455	209	104	180	61
11	------	72	68	80	76	79	580	384	189	101	135	61
12	------	69	66	77	74	104	425	645	185	104	93	66
13	------	71	76	76	72	99	425	1,230	384	95	90	72
14	------	71	79	71	71	99	580	785	295	93	86	66
15	------	76	76	71	71	1,030	395	580	209	92	76	63
16	------	80	77	74	71	785	340	455	177	93	76	61
17	------	97	104	79	77	515	300	395	155	95	76	61
18	------	92	84	86	84	368	252	515	138	90	72	61
19	------	72	84	135	79	295	217	485	138	90	72	61
20	------	71	71	95	82	243	209	373	125	84	72	76
21	------	71	69	93	84	196	226	305	115	82	72	63
22	------	74	68	101	79	181	192	262	112	82	69	61
23	------	68	71	92	71	159	173	234	109	82	66	61
24	------	71	74	106	71	131	162	209	860	82	66	61
25	------	69	72	145	123	123	162	192	515	79	66	61
26	------	68	71	128	230	548	142	181	310	76	66	61
27	------	72	71	123	162	285	128	425	248	76	66	58
28	------	71	71	99	135	217	123	335	204	76	66	58
29	69	92	71	92	------	196	115	252	166	76	63	58
30	71	80	71	82	------	230	112	213	148	79	63	58
31	66	------	69	85	------	267	------	189	------	84	63	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
November	97	68	74.2	0.371	0.41
December	104	66	73.1	.366	.42
January	145	69	90.2	.451	.52
February	230	71	89.4	.447	.47
March	1,030	79	237	1.18	1.36
April	985	112	327	1.64	1.83
May	7,420	115	668	3.34	3.85
June	860	109	291	1.46	1.63
July	145	76	97	.485	.56
August	180	63	79.1	.396	.46
September	76	58	62.8	.314	.35

Digitized by Google

MISCELLANEOUS DISCHARGE MEASUREMENTS

Measurements of the flow of streams in the Missouri River Basin at points other than regular gaging stations are recorded in the following table:

Miscellaneous discharge measurements in the Missouri River drainage basin during the year ending September 30, 1929

Date	Stream	Tributary to—	Locality	Gage height	Discharge
				Feet	*Sec.-ft.*
Aug. 17	Firehole River	Madison River	100 yards north of old Faithful Lodge, Yellowstone National Park, Wyo.		46.5
17	do	do	200 yards northeast of Sapphire Pool and 2½ miles northwest of Old Faithful Inn, Yellowstone National Park, Wyo.		133
Sept. 2	do	do	do		131
Aug. 17	Unnamed creek	Firehole River	Just across road from old Faithful Inn, Yellowstone National Park, Wyo.		*1.0
17	Iron Creek	do	100 yards above Green Springs and 1½ miles northwest of Old Faithful Inn, Yellowston National Park, Wyo.		31.9
Sept. 2	do	do	do		33.5
2	do	do	200 yards from mouth, just below mouth of Little Firehole River, and 2 miles northwest of Old Faithful Inn, Yellowstone National Park, Wyo.		78.8
Aug. 17	Niobe Creek	Iron Creek	200 feet above mouth, and 1½ miles northwest of Old Faithful Inn, Yellowstone National Park, Wyo.		*2.7
Sept. 2	do	do	40 feet above mouth, and 1½ miles northwest of Old Faithful Inn, Yellow-Stone National Park, Wyo.		4.7
2	Spring inflow	do	From left bank, between Niobe Creek and Yellow Bell Brook, 2 miles northwest of Old Faithful Inn, Yellowstone National Park, Wyo.		4.2
Aug. 17	Little Firehole River	do	200 yards above mouth, and 2 miles northwest of Old Faithful Inn, Yellowstone National Park, Wyo.		25.1
Oct. 4	Gardiner River	Yellowstone River	Above mouth of Panther Creek and 6 miles southwest of Mammoth Hotel, Yellowstone National Park, Wyo.		23.3
4	Panther Creek	Gardiner River	At mouth, 6 miles southwest of Mammoth Hotel, Yellowstone National Park, Wyo.		6.3
4	Glen Creek	do	One-eighth mile above Rustic Falls, 3 miles southwest of Mammoth Hotel, Yellowstone National Park, Wyo.		18.3
4	End of pipe line	Glen Creek	One-quarter mile above Rustic Falls, 3 miles southwest of Mammoth Hotel, Yellowstone National Park, Wyo.		14.9
June 20	Rapid Creek	Cheyenne River	Big Bend power plant, S. Dak.	2.97	291
July 26	do	do	do	2.05	117
Aug. 1	do	do	do	2.18	139
Sept. 7	do	do	do	1.80	94

* Estimated.

Digitized by Google

Miscellaneous discharge measurements in the Missouri River drainage basin during the year ending September 30, 1929—Continued

Date	Stream	Tributary to—	Locality	Gage height	Discharge
				Feet	*Sec.-ft.*
Apr. 5	Elk Creek	Cheyenne River	Near Elm Springs, S. Dak.		175
25	do	do	do		55
May 20	do	do	do		63
June 14	do	do	do		146
July 24	do	do	do		26
May 11	Laramie River	North Platte River	Bosler, Wyo.		518
June 18	North Boulder Creek	Boulder Creek	2 miles below Silver Lake, Colo.		77
1	Chambers Lake outlet	Cache la Poudre River.	3 miles above mouth, near Home, Colo.		208
May 20	do	do	One-quarter mile above mouth, near Home, Colo.		23
23	South Fork of Cache la Poudre River.	do	Derbys ranch, near Eggers, Colo.	.82	70
29	do	do	do	.90	95
13	Smoky Hill River	Kansas River	Salina, Kans.	20.79	4,640
Oct. 3	Osage River	Missouri River	6 miles southeast of Amoret, Mo.	1.11	19
23	do	do	do	3.54	412
Aug. 30	do	do	At Lock and Dam No. 1, 10 miles east of Jefferson City, Mo.	[b] 5.20	960
Sept. 10	do	do	do	[b] 4.85	864

[b] Refers to gage just below lock.

Digitized by Google

INDEX

A

Page

Accuracy of data and computed results..... 4–5
Acre-foot, definition of..... 2
Agency, Mo., Platte River at..... 223
Akron, Iowa, Big Sioux River at..... 164
Alder, Mont., Ruby River near..... 34
Allens Park, Colo., Middle St. Vrain Creek near..... 206
North St. Vrain Creek near..... 204
Alton, Kans., South Fork of Solomon River at..... 243
Alzada, Mont., Little Missouri River near.. 135
American Fork near Harlowton, Mont..... 65
Appropriations, record of..... 1
Arvada, Wyo, Clear Creek near..... 134
Powder River at..... 127
Ashland, Nebr., Platte River near..... 178

B

Bad River near Fort Pierre, S. Dak..... 153
Bagnell, Mo., Osage River near..... 269
Barnum, Wyo., Red Fork near..... 131
Barratts, Mont., Beaverhead River at..... 14
Battle Creek at international boundary..... 79
East Fork of, near international boundary..... 81
Beaver Creek at Ludell, Kans..... 234
near Burdock, S. Dak..... 145
Beaverhead River at Barratts, Mont..... 14
Belle Fourche River at Hulett, Wyo..... 149
near Belle Fourche, S. Dak..... 150
near Elm Springs, S. Dak..... 151
near Moorcroft, Wyo..... 148
Beloit, Kans., Solomon River at..... 244
Bennett Spring at Brice, Mo..... 276
Berthoud, Colo., Little Thompson River near..... 211
Beulah, Wyo., Redwater Creek near..... 152
Big Blue River at Hull, Kans..... 247
at Randolph, Kans..... 248
Big Hole River near Melrose, Mont..... 35
Big Horn River at Kane, Wyo..... 111
at Thermopolis, Wyo..... 110
near Hardin, Mont..... 112
Big Piney, Mo., Piney Creek near..... 281
Big Sandy Creek near Boxelder, Mont..... 76
Big Sioux River at Akron, Iowa..... 164
near Flandreau, S. Dak..... 163
Billings, Mont., Yellowstone River at..... 96
Birch Creek at Swift Dam, near Dupuyer, Mont..... 53
near Dupuyer, Mont..... 54
Bismarck, N. Dak., Missouri River at..... 20
Bloomington, Nebr., Republican River near. 225
Bonner Springs, Kans., Kansas River at..... 231
Boonville, Mo , Missouri River at..... 30

Page

Boulder, Colo., Lefthand Creek near..... 207
Boulder River near Boulder, Mont..... 36
near Contact, Mont..... 108
Boxelder, Mont., Big Sandy Creek near..... 76
Boxelder Creek near Careyhurst, Wyo..... 187
Brice, Mo., Bennett Spring at..... 276
Brinkman, Mont., Marias River near..... 52
Browning, Mont., North Fork of Milk River near..... 74
Brownington, Mo., South Grand River near. 274
Buffalo, Wyo., Crazy Woman Creek near.. 133
Bull Lake Creek near Lenore, Wyo..... 116
Burdock, S. Dak., Beaver Creek near..... 145
Burlington Junction, Mo., Nodaway River near..... 221
Burris, Wyo., Dinwoody Creek near..... 113
Dry Creek near..... 114
Byron, Wyo., Shoshone River at..... 122

C

Cache la Poudre River above Chambers Lake outlet, Colo..... 212
near Log Cabin, Colo..... 213
North Fork of, at Livermore, Colo..... 215
South Fork of, discharge measurements of..... 284
near Eggers, Colo..... 214
Canadian River at Cowdrey, Colo..... 182
Cannonball River near Timmer, N. Dak..... 139
Careyhurst, Wyo., Boxelder Creek near..... 187
Carlin, S. Dak., Cheyenne River near..... 144
Casper, Wyo., North Platte River at..... 172
Chamberlain, S. Dak., Missouri River at..... 22
Chambers Lake outlet, Colo., Cache la Poudre River above..... 212
discharge measurements of..... 284
Chance, Mont., Clark Fork at..... 106
Chariton River at Elmer, Mo..... 262
near Keytesville, Mo..... 263
Checkerboard Creek at Delpine, Mont..... 64
Cheyenne River at Edgemont, S. Dak..... 142
near Carlin, S. Dak..... 144
near Wasta, S. Dak..... 143
Cheyenne River Basin, S. Dak.-Wyo., gaging-station records in..... 142–152
Chinook, Mont., Matheson Canal near..... 83
Clancy, Mont., Prickly Pear Creek near..... 44
Clark Fork at Chance, Mont..... 106
at Edgar, Mont..... 107
below Crandall Creek, Wyo..... 105
Clear Creek near Arvada, Wyo..... 134
near Golden, Colo..... 208
West Fork of, near Empire, Colo..... 202
Clemons, Mont., Dearborn River near..... 48
Clifton City, Mo., Lamine River at..... 264
Clyde Park, Mont., Shields River at..... 102

Digitized by Google

	Page
Computations, results of, accuracy of	4–5
Conception Junction, Mo., Platte River at	222
Contact, Mont., Boulder River near	103
Control, definition of	2
Cooperation, record of	10
Correctionville, Iowa, Little Sioux River at	165
Corwin Springs, Mont., Yellowstone River at	94
Cottonwood Creek at Wendover, Wyo	193
Cowdrey, Colo., Canadian River at	182
Crandall, Creek Wyo., Clark Fork below	105
Crazy Woman Creek near Buffalo, Wyo	133
Creston, S. Dak., Rapid Creek at	147
Crow Agency, Mont., Little Horn River near	123
Crow Creek near Radersburg, Mont	43
Crowheart, Wyo., Willow Creek near	115
D	
Data, accuracy of	4–5
explanation of	2–4
Dayton, Wyo., Tongue River near	124
Dearborn River near Clemons, Mont	48
Decker, Mont., Tongue River near	125
Deer Creek at Glenrock, Wyo	186
Delaware River at Valley Falls, Kans	252
Delpine, Mont., Checkerboard Creek at	64
North Fork of Musselshell River at	60
Dillon, Mont., Grasshopper Creek near	33
Dinwoody Creek near Burris, Wyo	113
Douglas, Wyo., La Prele Creek near	188
North Platte River at	173
Drake, Colo., Thompson River near	209–210
Dry Creek near Burris, Wyo	114
Duncan, Nebr., Platte River near	177
Dupuyer, Mont., Birch Creek near	53–54
Dupuyer Creek near Valier, Mont	55
E	
Edgar, Mont., Clark Fork at	107
Edgemont, S. Dak., Cheyenne River at	142
Eggers, Colo., South Fork of Cache la Poudre River near	214
Elk Creek, S. Dak., discharge measurements of	284
Elkhorn River at Waterloo, Nebr	219
Ellsworth, Kans., Smoky Hill River at	238
Elm Springs, S. Dak., Belle Fourche River near	151
Elmer, Mo., Charlton River at	262
Empire, Colo., West Fork of Clear Creek near	202
Encampment River at Encampment, Wyo	183
Endicott, Nebr., Little Blue River near	249
F	
Fairfax, Mo., Tarkio River at	220
Firehole River, Wyo., discharge measurements of	283
Flandreau, S. Dak., Big Sioux River near	163
Flatwillow Creek at Petrolia, Mont	68
near Flatwillow, Mont	67
Fort Benton, Mont., Missouri River at	17
Teton River near	57
Fort Laramie, Wyo., Laramie River at	196
Fort Pierre, S. Dak., Bad River near	153
Fort Scott, Kans., Marmaton River near	271
Fort Washakie, Wyo., Little Wind River near	117
North Fork of Little Wind River at	118
Fowler, Mont., Dry Fork of Marias River at	56
Frenchman Canal near Saco, Mont	86
Frenchman Creek near Hamlet, Nebr	232
Frenchman River at international boundary	85
G	
Gallatin, Mo., Grand River near	255
Gallatin River at Logan, Mont	42
Galt, Mo., Medicine Creek near	253
Gardiner River at Mammoth Hotel, Yellowstone National Park	101
discharge measurement of	283
Gasconade River at Jerome, Mo	279
near Hazlegreen, Mo	277
near Rich Fountain, Mo	280
near Waynesville, Mo	278
Gasconade River Basin, Mo., gaging-station records in	277–282
Genoa, Nebr., Loup River near	217
Glen Creek, Wyo., discharge measurement of	283
Glendevey, Colo., Laramie River near	194
Glendo, Wyo., Horseshoe Creek near	192
Glenrock, Wyo., Deer Creek at	186
Golden Colo., Clear Creek near	203
Gordon, Nebr., Niobrara River near	157
Grand River near Gallatin, Mo	255
Grand River Basin, Mo., gaging-station records in	255–261
near Sumner, Mo	256
Grand River near Wakpala, S. Dak	140
Grasshopper Creek near Dillon, Mont	33
Greybull River at Meeteetse, Wyo	120
Grizzly Creek near Walden, Colo	166
Guernsey Reservoir, Wyo., North Platte River below	174
H	
Hamlet, Nebr., Frenchman Creek near	232
Hardin, Mont., Big Horn River near	112
Harlowton, Mont., American Fork near	65
Lebo Creek near	66
Musselshell River at	61
Havre, Mont., Milk River above	72
North Chinook Canal near	78
Hazlegreen, Mo., Gasconade River near	277
Hazen, N. Dak., Knife River at	137
Heart River at Sunny, N. Dak	138
Helena, Mont., Missouri River near	16
Tenmile Creek near	46
Henry, Nebr., Katzer Drain near	198
Hermann, Mo., Missouri River at	32
Horse Creek at international boundary	88
Horse Creek near Yoder, Wyo	199
Horseshoe Creek near Glendo, Wyo	192
Hulett, Wyo., Belle Fourche River at	149
Hull, Kans., Big Blue River at	247
Huron, S. Dak., James River at	161

Digitized by Google

I

	Page
Illinois Creek at Walden, Colo	181
Intake, Mont., Yellowstone River at	98
Interior, S. Dak., White River near	154
International boundary, Battle Creek at	79
East Fork of Battle Creek near	81
Frenchman River at	85
Horse Creek at	88
Lodge Creek at	77
Lyons Coulee at	82
McEachern Creek at	89
McRea Coulee at	77
Milk River at eastern crossing of	71
North Fork of Milk River near	75
Rock Creek at	87
South Fork at Milk River near	69
Whitewater Creek near	84
Woodpile Coulee near	80
Iron Creek, Wyo., discharge measurements of	283
Isbell, Mo., Missouri River at	31

J

James River at Huron, S. Dak	161
at Jamestown, N. Dak	160
near Scotland, S. Dak	162
Jamestown, N. Dak., James River at	160
Jefferson Island, Mont., South Boulder Creek near	37
Jefferson River near Silverstar, Mont	15
Jelm, Wyo., Laramie River near	195
Jerome, Kans., Smoky Hill River at	236
Jerome, Mo., Gasconade River at	279
Judith River near Utica, Mont	58
near Winifred, Mont	59

K

Kane, Wyo., Big Horn River at	111
Kansas City, Mo., Missouri River at	28
Kansas River at Bonner Springs, Kans	231
at Ogden, Kans	228
at Topeka, Kans	230
at Wamego, Kans	229
Kansas River Basin, Nebr.-Kans., gaging-station records in	224-254
Katzer Drain near Henry, Nebr	198
Kaycee, Wyo., Middle Fork of Powder River at	130
North Fork of Powder River near	132
Keytesville, Mo., Chariton River near	263
Kirwin, Kans., North Fork of Solomon River at	246
Knife River at Hazen, N. Dak	137

L

La Bonte, Wyo., Wagonhound Creek near	190
La Bonte Creek near La Bonte, Wyo	191
La Prele Creek near Douglas, Wyo	188
near Orpha, Wyo	189
Lamar River near Tower Falls ranger station, Yellowstone National Park	100
Lamine River at Clifton City, Mo	264
Laramie River at Fort Laramie, Wyo	196
discharge measurement of	284
near Glendevey, Colo	194
near Jelm, Wyo	195
Lawrence, Kans., Wakarusa River near	253
Leavenworth, Kans., Missouri River at	27
Lebo Creek near Harlowton, Mont	66
Lefthand Creek near Boulder, Colo	207
Lenore, Wyo., Bull Lake Creek near	116
Lingle, Wyo., Rawhide Creek near	197
Linneus, Mo., Locust Creek near	260
Little Blue River at Waterville, Kans	250
near Endicott, Nebr	249
Little Firehold River, Wyo., discharge measurement of	283
Little Horn River near Crow Agency, Mont	123
Little Missouri River at Medora, N. Dak	136
near Alzada, Mont	135
Little Osage River at Stotesbury, Mo	270
Little Piney Creek at Newburg, Mo	282
Little Prickly Pear Creek near Marysville, Mont	47
Little Sac River near Springfield, Mo	273
Little Sioux River at Correctionville, Iowa	165
Little Thompson River near Berthoud, Colo	211
Little Wind River near Fort Washakie, Wyo	117
North Fork of, at Fort Washakie, Wyo	118
Livermore, Colo, North Fork of Cache la Poudre River at	215
Livingston, Mont., Yellowstone River near	95
Locust Creek near Linneus, Mo	260
near Milan, Mo	259
Lodge Creek at international boundary	77
Log Cabin, Colo., Cache la Poudre River near	213
Logan, Mont., Gallatin River at	42
Loup River near Genoa, Nebr	217
Ludell, Kans., Beaver Creek at	234
Lyon, Mont., Madison River at	40
Lyons Coulee at international boundary	82

M

McEachern Creek at international boundary	89
McRea Coulee at international boundary	77
Madison River at Lyon, Mont	40
near Three Forks, Mont	41
near West Yellowstone, Mont	39
Marias River, Dry Fork of, at Fowler, Mont	56
near Brinkman, Mont	52
near Shelby, Mont	51
Marias River Basin, Mont, gaging-station records in	51-57
Marmaton River near Fort Scott, Kans	271
Marysville, Mont., Little Prickly Pear Creek near	47
Matheson Canal near Chinook, Mont	83
Max, Nebr., Republican River at	224
Medicine Creek near Galt, Mo	258
Medora, N. Dak., Little Missouri River at	136
Meeteetse, Wyo., Greybull River at	120
Melrose, Mont., Big Hole River near	35
Mentor, Kans., Smoky Hill River near	239
Michigan River at Walden, Colo	180
Middle Loup River at St. Paul, Nebr	216
Middle St. Vrain Creek near Allens Park, Colo	206
Milan, Mo., Locust Creek near	259
Miles City, Mont., Tongue River near	126
Yellowstone River at	97

Digitized by Google

	Page
Milk River above Havre, Mont	72
at eastern crossing of international boundary	71
at Milk River, Alberta	70
near Vandalia, Mont	73
North Fork of, above St. Mary Canal, near Browning, Mont	74
near international boundary	75
South Fork of, near international boundary	69
Milk River Basin, Alberta, Mont., gaging-station records in	69-89
Missouri River at Bismarck, N. Dak	20
at Boonville, Mo	30
at Chamberlain, S. Dak	22
at Fort Benton, Mont	17
at Hermann, Mo	32
at Isbell, Mo	31
at Kansas City, Mo	28
at Leavenworth, Kans	27
at Nebraska City, Nebr	25
at Omaha, Nebr	24
at St. Joseph, Mo	26
at Sanish, N. Dak	19
at Sioux City, Iowa	23
at Waverly, Mo	29
below Hauser Lake Dam, near Helena, Mont	16
near Mobridge, S. Dak	21
near Williston, N. Dak	18
Mizpah, Mont., Powder River near	129
Mobridge, S. Dak., Missouri River near	21
Monida, Mont., Red Rock River near	12-13
Moorcroft, Wyo., Belle Fourche River near	148
Moorhead, Mont., Powder River at	128
Moreau River at Promise, S. Dak	141
Mosby, Mont., Musselshell River at	63
Musselshell River at Harlowton, Mont	61
at Mosby, Mont	63
at Musselshell, Mont	62
North Fork of, at Delpine, Mont	60
Musselshell River Basin, Mont., gaging-station records in	60-68

N

Nebraska City, Nebr., Missouri River at	25
Nederland, Colo., North Boulder Creek near	208
Newburg, Mo., Little Piney Creek at	282
Niangua River near Roach, Mo	275
Niles, Kans., Solomon River at	245
Niobe Creek, Wyo., discharge measurements of	283
Niobrara River near Gordon, Nebr	157
near Spencer, Nebr	159
near Valentine, Nebr	158
Nodaway River near Burlington Junction, Mo	221
North Boulder Creek, Colo., discharge measurement of	284
near Nederland, Colo	208
North Chinook Canal near Havre, Mont	78
North Loup River near St. Paul, Nebr	218
North Platte River above Pathfinder Reservoir, Wyo	170
at Casper, Wyo	172
at Saratoga, Wyo	169
North Platte River at Douglas, Wyo	173
at Wyoming-Nebraska line	176
below Guernsey Reservoir, Wyo	174
below Pathfinder Reservoir, Wyo	171
below Whalen, Wyo	175
near Northgate, Colo	168
near Walden, Colo	167
North St. Vrain Creek near Allens Park, Colo	204
Northgate, Colo., North Platte River near	168
Nye, Mont., Stillwater River near	104

O

Oacoma, S. Dak., White River near	155
Oberlin, Kans., Sappa Creek near	233
Ogden, Kans., Kansas River at	226
Omaha, Nebr., Missouri River at	24
Orpha, Wyo., La Prele Creek near	189
Osage River at Trading Post, Kans	267
at Warsaw, Mo	268
discharge measurements of	284
near Bagnell, Mo	269
near Ottawa, Kans	266
near Quenemo, Kans	265
Osage (Marais des Cygnes) River Basin, Kans.-Mo., gaging-station records in	265-276
Ottawa, Kans., Osage River near	266
Owl Creek, South Fork of, near Thermopolis, Wyo	119

P

Pactola, S. Dak., Rapid Creek near	145-146
Painter, Wyo., Sunlight Creek near	108
Panther Creek, Wyo., discharge measurement of	283
Pass Creek near Saratoga, Wyo	184
Pathfinder Reservoir, Wyo., North Platte River above	170
North Platte River below	171
Petrolia, Mont., Flatwillow Creek at	68
Pfeifer, Kans., Smoky Hill River at	237
Piney Creek near Big Piney, Mo	281
Platte River at Agency, Mo	223
at Conception Junction, Mo	222
near Ashland, Nebr	178
near Duncan, Nebr	177
Platte River Basin, Colo.-Wyo.-Nebr., gaging-station records in	166-219
Powder River at Arvada, Wyo	127
at Moorhead, Mont	128
Middle Fork of, at Kaycee, Wyo	130
near Mizpah, Mont	129
North Fork of, near Kaycee, Wyo	132
Prairie Dog Creek near Woodruff, Kans	235
Prickly Pear Creek near Clancy, Mont	44
Prickly Pear Creek Basin, Mont., gaging-station records in	44-46
Promise, S. Dak., Moreau River at	141
Publications, information concerning	5-9
obtaining or consulting of	6
on stream flow, lists of	7, 9

Q

Quenemo, Kans., Osage River near	265

Digitized by Google

R

Page

Radersburg, Mont., Crow Creek near 43
Randolph, Kans., Big Blue River at 248
Rapid Creek at Creston, S. Dak 147
discharge measurements of 283
near Pactola, S. Dak 145-146
Rawhide Creek near Lingle, Wyo 197
Red Fork near Barnum, Wyo 131
Red Rock River at Metzel Ford, near Monida, Mont 12
below Red Rock Reservoir, near Monida, Mont 13
Redwater Creek near Beulah, Wyo 152
Republican River at Max, Nebr 224
at Scandia, Kans 226
at Wakefield, Kans 227
near Bloomington, Nebr 225
Rich Fountain, Mo., Gasconade River near 280
Rimini, Mont., Tenmile Creek near 45
Riverton, Wyo., Wind River at 109
Roach, Mo., Niangua River near 275
Roaring Fork near Walden, Colo 179
Rock Creek at international boundary 87
Rock Creek near Rock River, Wyo 185
Rock River, Wyo., Rock Creek near 185
Rothville, Mo., Yellow Creek near 261
Ruby River near Alder, Mont 34
Run-off in inches, definition of 2

S

Sac River near Stockton, Mo 272
Saco, Mont., Frenchman Canal near 86
St. Joseph, Mo., Missouri River at 26
St. Paul, Nebr., Middle Loup River at 216
North Loup River near 218
Saline River at Tescott, Kans 242
near Wilson, Kans 241
Sanish, N. Dak., Missouri River at 19
Sappa Creek near Oberlin, Kans 233
Saratoga, Wyo., North Platte River at 169
Pass Creek near 184
Scandia, Kans., Republican River at 226
Scotland, S. Dak., James River near 162
Second-feet per square mile, definition of 2
Second-foot, definition of 2
Shelby, Mont., Marias River near 51
Shields River at Clyde Park, Mont 102
Shoshone Reservoir, Wyo., Shoshone River below 121
Shoshone River at Byron, Wyo 122
below Shoshone Reservoir, Wyo 121
Silverstar, Mont., Jefferson River near 15
Sioux City, Iowa, Missouri River at 23
Smith River at Truly, Mont 50
near White Sulphur Springs, Mont 49
Smoky Hill River at Ellsworth, Kans 238
at Jerome, Kans 236
at Pfeifer, Kans 237
at Solomon, Kans 240
discharge measurement of 284
near Mentor, Kans 239
Soldier Creek at Topeka, Kans 251
Solomon, Kans., Smoky Hill River at 240
Solomon River at Beloit, Kans 244
at Niles, Kans 245
North Fork of, at Kirwin, Kans 246
South Fork of, at Alton, Kans 243

Page

South Boulder Creek near Jefferson Island, Mont 87
South Grand River near Brownington, Mo 274
South Platte, Colo., North Fork of South Platte River at 201
South Platte River at South Platte, Colo 200
North Fork of, at South Platte, Colo 201
South St. Vrain Creek near Ward, Colo 205
Spencer, Nebr., Niobrara River near 159
Springfield, Mo., Little Sac River near 273
Stage-discharge relation, definition of 2
Stillwater River near Nye, Mont 104
Stotesbury, Mo., Little Osage River at 270
Stockton, Mo., Sac River near 272
Stranger Creek near Tonganoxie, Kans 254
Sumner, Mo., Grand River near 256
Sunlight Creek near Painter, Wyo 108
Sunny, N. Dak., Heart River at 138

T

Tarkio River at Fairfax, Mo 220
Tenmile Creek near Helena, Mont 46
near Rimini, Mont 45
Terms, definition of 2
Tescott, Kans., Saline River at 242
Teton River near Fort Benton, Mont 57
Thermopolis, Wyo., Big Horn River at 110
South Fork of Owl Creek near 119
Thompson River at mouth of canyon, near Drake, Colo 210
at Trenton, Mo 257
below power house, near Drake, Colo 209
Three Forks, Mont., Madison River near 41
Timmer, N. Dak., Cannonball River near 139
Tonganoxie, Kans., Stranger Creek near 254
Tongue River near Dayton, Wyo 124
near Decker, Mont 125
near Miles City, Mont 126
Topeka, Kans., Kansas River at 230
Soldier Creek at 251
Tower Creek at Tower Falls, Yellowstone National Park 99
Trading Post, Kans., Osage River at 267
Trenton, Mo., Thompson River at 257
Truly, Mont., Smith River at 50

U

Utica, Mont., Judith River near 58

V

Valentine, Nebr., Niobrara River near 158
Valier, Mont., Dupuyer Creek near 55
Valley Falls, Kans., Delaware River at 252
Vandalia, Mont., Milk River near 73

W

Wagonhound Creek near La Bonte, Wyo 190
Wakarusa River near Lawrence, Kans 253
Wakefield, Kans., Republican River at 227
Wakpala, S. Dak., Grand River near 140
Walden, Colo., Grizzly Creek near 166
Illinois Creek at 181
Michigan River at 180
North Platte River near 167
Roaring Fork near 179

Digitized by Google

	Page
Wamego, Kans., Kansas River at	229
Ward, Colo., South St. Vrain Creek near	205
Warsaw, Mo., Osage River at	268
Wasta, S. Dak., Cheyenne River near	143
Waterloo, Nebr., Elkhorn River at	219
Waterville, Kans., Little Blue River at	250
Waverly, Mo., Missouri River at	29
Waynesville, Mo., Gasconade River near	278
Wendover, Wyo., Cottonwood Creek at	193
West Yellowstone, Mont., Madison River near	39
Whalen, Wyo., North Platte River below	175
White River near Interior, S. Dak	154
near Oacoma, S. Dak	155
South Fork of, near White River, S. Dak	156
White Sulphur Springs, Mont., Smith River near	49
Whitewater Creek near international boundary	84
Williston, N. Dak., Missouri River near	18
Willow Creek near Crowheart, Wyo	115
near Willow Creek, Mont	38
Wilson, Kans., Saline River near	241
Wind River at Riverton, Wyo	109
Winifred, Mont., Judith River near	59
Woodpile Coulee near international boundary	80
Woodruff, Kans., Prairie Dog Creek near	235
Work, authorization of	1
division of	10–11
scope of	1–2
Y	
Yellow Creek near Rothville, Mo	261
Yellowstone Lake at Lake Hotel, Yellowstone National Park	90
Yellowstone National Park, Gardiner River in	101
Lamar River in	100
Tower Creek in	99
Yellowstone Lake in	90
Yellowstone River in	91–93
Yellowstone River at Billings, Mont	96
at Corwin Springs, Mont	94
at Intake, Mont	98
near Livingston, Mont	95
at Miles City, Mont	97
at Yellowstone Lake outlet, Yellowstone National Park	91–92
near Canyon Hotel, Yellowstone National Park	93
Yellowstone River Basin, Mont.-Wyo., gaging-station records in	90–134
Yoder, Wyo., Horse Creek near	199

Digitized by Google

PLEASE DO NOT DESTROY OR THROW AWAY THIS PUBLICATION. If you have no further use for it, write to the Geological Survey at Washington and ask for a frank to return it

UNITED STATES DEPARTMENT OF THE INTERIOR

SURFACE WATER SUPPLY *of the* UNITED STATES 1929

PART VII

LOWER MISSISSIPPI RIVER BASIN

Prepared in cooperation with the States of
MISSOURI, ARKANSAS, KANSAS, AND TEXAS

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 687

GEOLOGY DEPARTMENT
STANFORD UNIVERSITY

Digitized by Google

Digitized by Google

UNITED STATES DEPARTMENT OF THE INTERIOR
RAY LYMAN WILBUR, Secretary
GEOLOGICAL SURVEY
GEORGE OTIS SMITH, Director

Water-Supply Paper 687

SURFACE WATER SUPPLY *of the* UNITED STATES 1929

PART VII
LOWER MISSISSIPPI RIVER BASIN

NATHAN C. GROVER, Chief Hydraulic Engineer
H. C. BECKMAN, W. S. FRAME, J. H. GARDINER, J. B. SPIEGEL, C. E. McCASHIN and C. E. ELLSWORTH, District Engineers

Prepared in cooperation with the States of
MISSOURI, ARKANSAS, KANSAS, and TEXAS

GEOLOGY DEPARTMENT
STANFORD UNIVERSITY

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1931

For sale by the Superintendent of Documents, Washington, D. C. - Price 15 cents, paper cover

Digitized by Google

Digitized by Google

CONTENTS

	Page
Authorization and scope of work	1
Definition of terms	2
Explanation of data	2
Accuracy of field data and computed results	4
Publications	5
Cooperation	10
Division of work	10
Gaging-station records	11
Meramec River Basin	11
Meramec River near Steelville, Mo	11
Meramec River near Sullivan, Mo	12
Meramec River near Eureka, Mo	13
Meramec Spring near St. James, Mo	14
Bourbeuse River at Union, Mo	15
Big River at Byrnesville, Mo	16
Headwater Diversion Channel Basin	17
Castor River at Zalma, Mo	17
St. Francis River Basin	18
St. Francis River floodway near Marked Tree, Ark	18
Little River ditch No. 81 near Kennett, Mo	19
Little River ditch No. 1 near Kennett, Mo	20
Little River ditch No. 66 near Kennett, Mo	21
Little River ditch No. 66–A near Kennett, Mo	22
Little River ditch No. 251 near Kennett, Mo	23
Little River ditch No. 259 near Kennett, Mo	24
Big Lake outlet near Manila, Ark	25
White River Basin	26
White River at Beaver, Ark	26
White River near Flippin, Ark	27
White River near Newport, Ark	28
White River at DeValls Bluff, Ark	29
James River near Battlefield, Mo	30
James River below Battlefield, Mo	31
James River at Galena, Mo	32
Buffalo River near Rush, Ark	33
North Fork of White River at Tecumseh, Mo	34
North Fork of White River near Henderson, Ark	35
Black River at Leeper, Mo	36
Black River at Black Rock, Ark	37
Current River at Van Buren, Mo	38
Current River at Doniphan, Mo	39
Big Spring near Van Buren, Mo	40
Eleven Point River near Bardley, Mo	41
Greer Spring at Greer, Mo	42
Little Red River near Heber Springs, Ark	43
Cache River at Patterson, Ark	44

Digitized by Google

Gaging-station records—Continued. Page
Arkansas River Basin 45
Arkansas River at Syracuse, Kans 45
Arkansas River at Garden City, Kans 46
Arkansas River at Larned, Kans 47
Arkansas River near Wichita, Kans 48
Arkansas River at Arkansas City, Kans 49
Arkansas River at Van Buren, Ark 50
Arkansas River at Little Rock, Ark 51
Pawnee River near Larned, Kans 52
Little Arkansas River at Valley Center, Kans 53
Walnut River at Winfield, Kans 54
Verdigris River at Independence, Kans 55
Neosho River near Iola, Kans 56
Neosho River near Parsons, Kans 57
Neosho River near Grove, Okla 58
Cottonwood River at Elmdale, Kans 59
Spring River near Waco, Mo 60
Shoal Creek near Joplin, Mo 61
Yazoo River Basin 62
Tallahatchie River near Sardis, Miss 62
Yocona River near Enid, Miss 63
Coldwater River near Coldwater, Miss 65
Yalobusha River at Grenada, Miss 66
Red River Basin 68
Red River near Denison, Tex 68
Red River at Garland City, Ark 69
Red River at Shreveport, La 70
Pease River near Crowell, Tex 71
Washita River near Durwood, Okla 71
Kiamichi River near Belzoni, Okla 73
Little River near Wilton, Ark 74
Sulphur River near Darden, Tex 75
Cypress Creek near Jefferson, Tex 76
Bayou Dorcheat near Minden, La 77
Ouachita River near Hot Springs, Ark 78
Ouachita River at Remmel Dam, near Malvern, Ark 79
Ouachita River at Arkadelphia, Ark 80
Ouachita River near Camden, Ark 81
Little Missouri River near Murfreesboro, Ark 82
Saline River near Warren, Ark 83
Bayou Bartholomew near Beekman, La 84
Miscellaneous discharge measurements 85
Index 87

ILLUSTRATION

Page
FIGURE 1. Typical river measurement station showing concrete well and house for water-stage recorder and staff gages, cable, and car 3

Digitized by Google

SURFACE WATER SUPPLY OF LOWER MISSISSIPPI RIVER BASIN, 1929

AUTHORIZATION AND SCOPE OF WORK

This volume is one of a series of 14 reports presenting results of measurements of flow made on streams in the United States during the year ending September 30, 1929.

The data presented in these reports were collected by the United States Geological Survey under the following authority contained in the organic law (20 Stat. L., p. 394):

Provided, That this officer [the Director] shall have the direction of the Geological Survey and the classification of public lands and examination of the geological structure, mineral resources, and products of the national domain.

The work was begun in 1888 in connection with special studies relating to irrigation in the West. Since the fiscal year ending June 30, 1895, successive appropriation bills passed by Congress have carried the following items:

For gaging the streams and determining the water supply of the United States, and for the investigation of underground currents and artesian wells, and for the preparation of reports upon the best methods of utilizing the water resources.

Annual appropriations for the fiscal years ending June 30, 1895–1929

1895	$12,500.00	1919	$148,244.10
1896	24,500.00	1920	175,000.00
1897–1899	50,000.00	1921–1923	180,000.00
1900	70,000.00	1924–25	170,000.00
1901–2	100,000.00	1926	165,000.00
1903–1906	200,000.00	1927	151,000.00
1907	150,000.00	1928	147,000.00
1908–1910	100,000.00	1929	270,500.00
1911–1917	150,000.00	1930	275,000.00
1918	175,000.00		

In this work many private and State organizations have cooperated, either by furnishing records or by assisting in collecting data. Acknowledgements for cooperation of the first kind are made in connection with the description of each station affected; cooperation of the second kind is acknowledged on page 10.

Measurements of stream flow have been made at about 5,830 points in the United States and also at many points in Alaska and the

Digitized by Google

Hawaiian Islands. In July, 1929, 2,240 gaging stations were being maintained by the Geological Survey and the cooperating organizations. Many miscellaneous discharge measurements were made at other points. In connection with this work data were also collected in regard to precipitation, evaporation, storage reservoirs, river profiles, and water power in many sections of the country and will be made available in water-supply papers from time to time.

DEFINITION OF TERMS

The volume of water flowing in a stream—the "run-off" or "discharge"—is expressed in various terms, each of which has become associated with a certain class of work. These terms may be divided into two groups—(1) those that represent a rate of flow, as second-feet, gallons per minute, miner's inches, and second-feet per square mile, and (2) those that represent the actual quantity of water, as run-off in inches, acre-feet, and millions of cubic feet. The principal terms used in this series of reports are second-feet, second-feet per square mile, and run-off in inches and in acre-feet. They may be defined as follows:

"Second-feet" is an abbreviation for "cubic feet per second." A second-foot is the rate of discharge of water flowing in a channel of rectangular cross section 1 foot wide and 1 foot deep at an average velocity of 1 foot per second. It is generally used as a fundamental unit from which others are computed.

"Second-feet per square mile" is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the run-off is distributed uniformly both as regards time and area.

"Run-off in inches" is the depth to which an area would be covered if all the water flowing from it in a given period were uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in inches.

An "acre-foot," equivalent to 43,560 cubic feet, is the quantity required to cover an acre to the depth of 1 foot. The term is commonly used in connection with storage for irrigation.

The following terms not in common use are here defined:

"Stage-discharge relation," an abbreviation for the term "relation of gage height to discharge."

"Control," a term used to designate the natural section or stretch of the channel or artificial structure below the gage which determines the stage-discharge relation at the gage.

EXPLANATION OF DATA

The data presented in this report cover the year beginning October 1, 1928, and ending September 30, 1929. At the beginning of January in most parts of the United States much of the precipitation in

Digitized by Google

the preceding three months is stored in the form of snow or ice, or in ponds, lakes, and swamps, or as underground water, and this stored water passes off in the streams during the spring break-up. At the end of September, on the other hand, the only stored water available for run-off is possibly a small quantity in the ground; therefore the run-off for the year beginning October 1 is practically all derived from precipitation within that year.

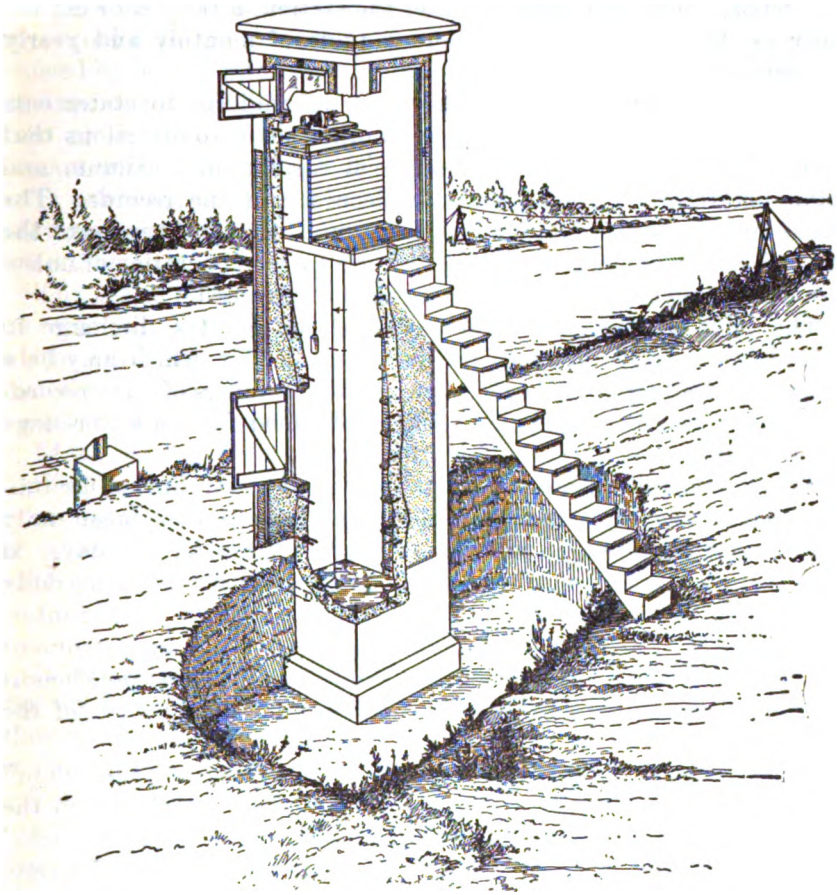

FIGURE 1.—Typical river measurement station showing concrete well and house for water-stage recorder and staff gages, cable, and car

The base data collected at gaging stations consist of records of stage, measurements of discharge, and general information used to supplement the gage heights and discharge measurements in determining the daily flow. The records of stage are obtained either from direct readings on a staff or chain gage or from a water-stage recorder that gives a continuous record of the fluctuations. Measurements of discharge are made with a current meter by the general methods outlined in standard textbooks on the measurement of river dis-

Digitized by Google

charge. A typical gaging station, equipped with water-stage recorder and measuring cable and car, is shown in Figure 1.

From the discharge measurements rating tables are prepared that give the discharge for any stage. The application of the daily gage heights to these rating tables gives the daily discharge from which the monthly and yearly mean discharge is determined.

The data presented for each gaging station in the area covered by this report comprise a description of the station, a table showing the daily discharge of the stream, and a table of monthly and yearly discharge and run-off.

The description of the station gives, in addition to statements regarding location and type of gage, information as to diversions that decrease the flow at the gage, artificial regulation, maximum and minimum recorded stages, and the accuracy of the records. The maximum discharge given under "Extremes" does not represent the crest discharge unless a water-stage recorder was in operation or unless a nonrecording gage was read at the time of the crest.

The table of daily discharge gives, in general, the discharge in second-feet corresponding to the daily gage height, which may be a once-daily reading or the mean of twice-daily readings of a nonrecording gage or the mean daily gage height obtained from a water-stage recorder graph.

At stations on streams subject to sudden or rapid diurnal fluctuation the discharge obtained from the rating table and the mean daily gage height may not be the true mean discharge for the day. If such stations are equipped with water-stage recorders the mean daily discharge may be obtained by averaging discharge at regular intervals during the day or by using the discharge integrator, an instrument for obtaining mean daily discharge from a continuous gage-height graph and containing as an essential element the rating curve of the station.

In the table of monthly discharge the column headed "Maximum" gives the maximum daily discharge, and not the discharge when the water surface was at crest height. Likewise, in the column headed "Minimum" the quantity given is the minimum daily discharge. The column headed "Mean" is the average flow in cubic feet per second during the month. On this average flow are based computations recorded in the remaining columns, which are defined on page 2.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS

The accuracy of stream-flow data depends primarily (1) on the permanency of the stage-discharge relation and (2) on the accuracy of observation of stage, measurements of flow, and interpretation of records.

Digitized by Google

The station description gives a statement in regard to the general accuracy of the records. "Excellent" indicates that records are accurate within 5 per cent; "good," within 10 per cent; "fair," within 15 per cent; and "poor," within 20 per cent or more.

The monthly means for any station may represent with high accuracy the quantity of water flowing past the gage, but the figures showing discharge per square mile and run-off in inches may be misleading owing to the inclusion of large noncontributing districts in the measured drainage area, and they may also be subject to gross errors caused by lack of information concerning water diverted for irrigation or other use, or by inability to interpret the effect of artificial regulation of the flow of the river above the station. "Second-feet per square mile" and "run-off in inches" are therefore not computed if such errors appear probable. The computations are also omitted for stations on streams draining areas in which the annual rainfall is less than 20 inches.

The tables of monthly discharge give a general idea of the flow at the station. The table of daily discharge allows more detailed studies of the variation in flow. It should be borne in mind, however, that the observations in each succeeding year may be expected to throw new light on data previously published.

Many gaging stations on streams in the irrigated areas of the United States are situated above most of the diversions from those streams, and the discharge recorded does not show the water supply available for further development, as prior appropriations below the stations must first be satisfied.

PUBLICATIONS

Investigation of water resources by the United States Geological Survey has consisted in large part of measurements of the volume of flow of streams and studies of the conditions affecting that flow, but it has comprised also investigation of such closely allied subjects as irrigation, water storage, water powers, underground waters, and quality of waters. Most of the results of these investigations have been published in water-supply papers, but some have appeared in the monographs, bulletins, professional papers, and annual reports.

The results of stream-flow measurements are now published annually in 12 parts, each part covering an area whose boundaries coincide with natural drainage features as indicated below:

Part I. North Atlantic slope basins (St. Johns River to York River).
II. South Atlantic slope and eastern Gulf of Mexico basins (James River to the Mississippi).
III. Ohio River Basin.
IV. St. Lawrence River Basin.
V. Hudson Bay and upper Mississippi River Basins.
VI. Missouri River Basin.
VII. Lower Mississippi River Basin.

Digitized by Google

Part VIII. Western Gulf of Mexico basins.
IX. Colorado River Basin.
X. The Great Basin.
XI. Pacific slope basins in California.
XII. North Pacific slope basins, in three parts:
A, Pacific slope basins in Washington and upper Columbia River Basin.
B, Snake River Basin.
C, Pacific slope basins in Oregon and lower Columbia River Basin.

Water-supply papers and other publications of the United States Geological Survey containing data in regard to the water resources of the United States may be obtained or consulted as indicated below:

1. Copies may be purchased at nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D. C., who will, on application, furnish lists giving prices.

2. Sets of the reports may be consulted in the libraries of the principal cities in the United States.

3. Sets are available for consultation in the local offices of the water-resources branch of the Geological Survey, as follows:

Augusta, Me., Statehouse.
Boston, Mass., 2500 Customhouse.
Hartford, Conn., 60 Washington Street
Albany, N. Y., 506 Broadway-Arcade Building.
Trenton, N. J., 710 Trenton Trust Building.
Charlottesville, Va., Brooks Museum, University of Virginia.
South Charleston, W. Va., Naval Ordnance Plant.
Asheville, N. C., 210 Post Office Building
Columbia, S. C., 801 National Loan & Exchange Bank Building.
Ocala, Fla., Post Office Building.
Tuscaloosa, Ala., Post Office Building.
Chattanooga, Tenn., 630 Power Building.
Columbus, Ohio, Engineering Experiment Station, Ohio State University
Indianapolis, Ind., 319 Federal Building.
Lansing, Mich., M9 State Office Building.
Chicago, Ill., 1503 Consumers Building.
Madison, Wis., 337N State Capitol.
St. Paul, Minn., 202 Old State Capitol.
Topeka, Kans., 23 Federal Building.
Rolla, Mo., Rolla Building, School of Mines and Metallurgy.
Fort Smith, Ark., Post Office Building.
Austin, Tex., State Capitol.
Tucson, Ariz., 210 Post Office Building.
Denver, Colo., 403 Post Office Building.
Salt Lake City, Utah, 313 Federal Building.
Idaho Falls, Idaho, 228 Federal Building.
Boise, Idaho, Federal Building.
Helena, Mont., 416 Power Block.
Tacoma, Wash., 406 Federal Building.
Portland, Oreg., 606 Post Office Building.
San Francisco, Calif., 303 Customhouse.
Los Angeles, Calif., 751 South Figueroa Street, room 510.
Honolulu, Hawaii, Territorial Office Building.

Digitized by Google

A list of the Geological Survey's publications may be obtained by applying to the Director, United States Geological Survey, Washington, D. C.

Stream-flow records have been obtained at about 5,830 points in the United States, and the data obtained have been published in the reports tabulated below.

Stream-flow data in reports of the United States Geological Survey

[A = Annual Report; B = Bulletin; W = Water-Supply Paper]

Report	Character of data	Year
10th A, pt. 2	Descriptive information only	
11th A, pt. 2	Monthly discharge and descriptive information	1884 to Sept., 1890.
12th A, pt. 2	do	1884 to June 30, 1891.
13th A, pt. 3	Mean discharge in second-feet	1884 to Dec. 31, 1892.
14th A, pt. 2	Monthly discharge (long-time records, 1871 to 1893)	1888 to Dec. 31, 1893.
B 131	Descriptions, measurements, gage heights, and ratings	1893 and 1894.
16th A, pt. 2	Descriptive information only	
B 140	Descriptions, measurements, gage heights, ratings, and monthly discharge (also many data covering earlier years).	1895.
W 11	Gage heights (also gage heights for earlier years)	1896.
18th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also similar data for some earlier years).	1895 and 1896.
W 15	Descriptions, measurements, and gage heights, eastern United States, eastern Mississippi River, and Missouri River above junction with Kansas.	1897.
W 16	Descriptions, measurements, and gage heights, western Mississippi River below junction of Missouri and Platte Rivers, and western United States.	1897.
19th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also some long-time records), 1897.	1897.
W 27	Measurements, ratings, and gage heights, eastern United States, eastern Mississippi River, and Missouri River.	1898.
W 28	Measurements, ratings, and gage heights, Arkansas River and western United States.	1898.
20th A, pt. 4	Monthly discharge (also for many earlier years)	1898.
W 35 to 39	Descriptions, measurements, gage heights, and ratings	1899.
21st A, pt. 4	Monthly discharge	1899.
W 47 to 52	Descriptions, measurements, gage heights, and ratings	1900.
22d A, pt. 4	Monthly discharge	1900.
W 65, 66	Descriptions, measurements, gage heights, and ratings	1901.
W 75	Monthly discharge	1901.
W 82 to 85	Complete data	1902.
W 97 to 100	do	1903.
W 124 to 135	do	1904.
W 165 to 178	do	1905.
W 201 to 214	do	1906.
W 241 to 252	do	1907–8.
W 261 to 272	do	1909.
W 281 to 292	do	1910.
W 301 to 312	do	1911.
W 321 to 332	do	1912.
W 351 to 362	do	1913.
W 381 to 394	do	1914.
W 401 to 414	do	1915.
W 431 to 444	do	1916.
W 451 to 464	do	1917.
W 471 to 484	do	1918.
W 501 to 514	do	1919–20.
W 521 to 534	do	1921.
W 541 to 554	do	1922.
W 561 to 574	do	1923.
W 581 to 594	do	1924.
W 601 to 614	do	1925.
W 621 to 634	do	1926.
W 641 to 654	do	1927.
W 661 to 674	do	1928.
W 681 to 694	do	1929.

Digitized by Google

The records at most of the stations discussed in these reports extend over a series of years. Miscellaneous measurements at many points other than regular gaging stations have been made each year and are published under "Miscellaneous discharge measurements" at the end of each report, in the same relative order as the regular gaging stations. An index of the reports containing records obtained prior to 1904 has been published in Water-Supply Paper 119.

The following table gives, by years and drainage basins, the numbers of the papers on surface-water supply published from 1899 to 1929. The data for any particular station will, as a rule, be found in the reports covering the years during which the station was maintained. For example, data for 1910 to 1920 for any station in the area covered by Part III are published in Water-Supply Papers 283, 303, 323, 353, 383, 403, 433, 453, 473, and 503, which contain records for the Ohio River Basin for those years.

Digitized by Google

Numbers of water-supply papers containing results of stream measurements, 1899–1929

[[For basins included see p. 5]]

Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII-A	XII-B	XII-C
1899 [a]	35	[b] 35, 36	36	36	36	[a] 36, 37	37	37	[d] 37, 38	38, [a] 39	38, [f] 39	38	38	38
1900 [a]	47, [b] 48	48	48, [c] 49	49	49	49, [f] 50	50	50	50	51	51	51	51	51
1901	65, 75	65, 75	65, 75	65, 75	[b] 65, 66, 75	66, 75	[b] 65, 66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75
1902	82	[b] 82, 83	83	[c] 82, 83	[b] 83, 84	84	[b] 83, 84	84	85	85	85	85	85	85
1903	97	[b] 97, 98	98	97	[b] 98, 99, [m] 100	99	[b] 98, 99	99	100	100	100	100	100	100
1904	[n] 124, [a] 125, [p] 126	[p] 126, 127	128	129	[b] 128, 130	130, [a] 131	[b] 128, 131	132	133	133, [r] 134	134	135	135	135
1905	[n] 165, [a] 166, [p] 203	[p] 167, 168	169	170	171	172	[b] 169, 173	174	175, [a] 177	176, [r] 177	177	178	178	[t] 177, 178
1906	[n] 201, [a] 202, [p] 203	[p] 203, 204	205	206	207	208	[b] 205, 209	210	211, [a] 213	212, [r] 213	213	214	214	214
1907–8	241	242	243	244	245	246	247	248	249	250, [r] 251	251	252	252	252
1909	261	262	263	264	265	266	267	268	269	270, [r] 271	271	272	272	272
1910	281	282	283	284	285	286	287	288	289	290	291	292	292	292
1911	301	302	303	304	305	306	307	308	309	310	311	312	312	312
1912	321	322	323	324	325	326	327	328	329	330	331	332-A	332-B	332-C
1913	351	352	353	354	355	356	357	358	359	360	361	362-A	362-B	362-C
1914	381	382	383	384	385	386	387	388	389	390	391	392	393	394
1915	401	402	403	404	405	406	407	408	409	410	411	412	413	414
1916	431	432	433	434	435	436	437	438	439	440	441	442	443	444
1917	451	452	453	454	455	456	457	458	459	460	461	462	463	464
1918	471	472	473	474	475	476	477	478	479	480	481	482	483	484
1919–20	501	502	503	504	505	506	507	508	509	510	511	512	513	514
1921	521	522	523	524	525	526	527	528	529	530	531	532	533	534
1922	541	542	543	544	545	546	547	548	549	550	551	552	553	554
1923	561	562	563	564	565	566	567	568	569	570	571	572	573	574
1924	581	582	583	584	585	586	587	588	589	590	591	592	593	594
1925	601	602	603	604	605	606	607	608	609	610	611	612	613	614
1926	621	622	623	624	625	626	627	628	629	630	631	632	633	634
1927	641	642	643	644	645	646	647	648	649	650	651	652	653	654
1928	661	662	663	664	665	666	667	668	669	670	671	672	673	674
1929	681	682	683	684	685	686	687	688	689	690	691	692	693	694

[a] Rating tables and index to Water-Supply Papers 35–39 contained in Water-Supply Paper 39. Tables of monthly discharge for 1899 in Twenty-first Annual Report, Part IV.
[b] James River only.
[c] Gallatin River.
[d] Green and Gunnison Rivers and Grand River above junction with Gunnison.
[e] Mohave River only.
[f] Kings and Kern Rivers and south Pacific slope basins.
[g] Rating tables and index to Water-Supply Papers 47–52 and data on precipitation, wells, and irrigation in California and Utah contained in Water-Supply Paper 52. Tables of monthly discharge for 1900 in Twenty-second Annual Report, Part IV.
[h] Wissahickon and Schuylkill Rivers to James River.
[i] Scioto River.
[j] Loup and Platte Rivers near Columbus, Nebr., and all tributaries below junction with Platte.
[k] Tributaries of Mississippi from east.
[l] Lake Ontario and tributaries to St. Lawrence River.
[m] Hudson Bay only.
[n] New England rivers only.
[o] Hudson River to Delaware River, inclusive.
[p] Susquehanna River to Yadkin River, inclusive.
[q] Platte and Kansas Rivers.
[r] Great Basin in California except Truckee and Carson River Basins.
[s] Below junction with Gila.
[t] Rogue, Umpqua, and Siletz Rivers only.

Digitized by Google

COOPERATION

The work was done in cooperation with the several States as follows: In Missouri with the Missouri Bureau of Geology and Mines, H. A. Buehler, State geologist; in Arkansas with the Arkansas Geological Survey, Dr. G. C. Branner, State geologist; in Kansas with the water resources division of the State Board of Agriculture, George S. Knapp, chief engineer; in Texas with the State through the Board of Water Engineers, John A. Norris, chairman, C. S. Clark, and A. H. Dunlap.

Acknowledgment is due also to the Corps of Engineers, United States Army, for financial assistance in collecting records published herein.

Financial assistance was also rendered by the following cities, corporations, and individuals: In Missouri by the Missouri Game and Fish Department, Little River Drainage District, Empire District Electric Co., Missouri Hydroelectric Power Co., Willis H. Meredith, and the Springfield City Water Co.; in Arkansas by the Arkansas Power & Light Co. and White River Power Co.; in Oklahoma by the Public Service Co. of Oklahoma.

DIVISION OF WORK

Data for stations in Missouri were collected and prepared for publication under the direction of H. C. Beckman, district engineer, assisted by V. L. Austin, H. C. Bolon, R. D. Schmickle, A. L. Hill, and C. H. Jennings.

Data for stations in Arkansas, Oklahoma, and Louisiana were collected and prepared for publication under the direction of W. S. Frame and J. H. Gardiner, district engineers, assisted by O. B. Johnson.

Data for stations in Kansas were collected and prepared for publication under the direction of J. B. Spiegel, district engineer, assisted by Charles Wells, W. M. Littlefield, R. V. Smrha, and Mrs. Maude Moon.

Data for stations in Mississippi were collected and prepared for publication under the direction of C. E. McCashin, district engineer, assisted by P. E. Hanson, Penn Livingston, D. M. Corbett, J. L. Saunders, W. S. Eisenlohr, jr., C. H. Prior, K. C. Tippy, E. J. Tripp, I. E. Anderson, and Miss Annie L. Hardin.

Data for stations in Texas and for the station on Kiamichi River near Belzoni, Okla., were collected and prepared for publication under the direction of C. E. Ellsworth, district engineer, assisted by Trigg Twichell, S. D. Breeding, Tate Dalrymple, A. C. Cook, N. C. Magnuson, Kate Casparis, A. B. Goodwin, C. A. Young, B. S. Odom, V. W. Rupp, P. H. Holland, F. C. Ames, and V. L. Austin.

The manuscript was reviewed and assembled by J. I. Perrey.

Digitized by Google

GAGING-STATION RECORDS

MERAMEC RIVER BASIN

MERAMEC RIVER NEAR STEELVILLE, MO.

LOCATION.—Chain gage in NE. ¼ sec. 21, T. 38 N., R. 4 W., half a mile above Whittenberg Creek and 2½ miles north of Steelville. Zero of gage is 681.86 feet above mean sea level.

DRAINAGE AREA.—Approximately 830 square miles.

RECORDS AVAILABLE.—December, 1922, to September, 1929.

EXTREMES.—Maximum discharge during year, 17,600 second-feet May 7 (gage height, 14.25 feet); minimum discharge, 151 second-feet Oct. 1–7; minimum gage height, 0.70 foot Sept. 27–30.

1923–1929: Maximum discharge, 36,000 second-feet Apr. 1, 1927 (gage height, 19.40 feet); minimum, 115 second-feet July 25 to Aug. 1, 1926.

Maximum stage known, 26.5 feet Aug. 20, 1915 (discharge, about 60,000 second-feet).

REMARKS.—Records good except those estimated.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	151	165	200	*195	355	595	3,700	425	595	*395	*270	*178
2	151	165	230	*193	332	535	1,030	2,700	3,050	*393	*254	*178
3	151	165	222	192	332	450	820	4,300	2,790	*390	*238	178
4	151	165	215	192	310	505	718	2,110	1,680	*388	222	175
5	151	165	215	222	310	565	595	1,680	1,100	*385	215	185
6	151	165	215	270	310	478	535	6,510	890	*383	207	200
7	151	165	215	310	290	425	505	17,600	1,340	*380	*200	222
8	165	165	215	*310	290	400	2,880	3,320	*1,180	378	*700	207
9	165	165	215	310	*260	355	6,070	3,500	1,030	355	655	203
10	165	165	192	290	230	332	7,940	2,280	855	332	450	200
11	165	165	192	250	270	332	2,960	1,770	718	332	685	192
12	165	165	192	270	250	310	1,940	1,520	595	310	625	222
13	165	165	215	250	250	310	1,430	5,300	1,340	*290	535	230
14	165	168	215	230	250	310	1,200	4,300	1,030	*270	450	*240
15	178	172	215	230	230	595	1,860	2,790	855	*400	355	250
16	192	178	230	230	230	6,730	2,280	*2,620	1,520	*500	332	230
17	200	185	270	230	250	2,880	*1,690	2,450	625	*420	270	215
18	196	200	310	270	250	1,520	1,100	2,360	535	*360	*270	207
19	192	230	332	378	250	1,100	960	2,450	505	310	270	207
20	185	222	290	478	250	890	855	1,770	478	270	230	*207
21	178	215	270	425	250	750	820	1,430	450	270	270	207
22	*175	200	270	378	250	750	820	1,100	425	250	250	*205
23	*171	189	230	355	250	565	718	960	425	250	250	203
24	168	192	230	*850	*260	535	685	890	*525	250	*221	200
25	165	185	222	1,340	270	535	595	820	625	230	192	196
26	165	185	219	1,100	655	1,600	535	785	685	230	185	192
27	165	185	215	820	785	890	450	750	565	230	182	158
28	165	185	207	625	750	685	400	750	505	*230	178	*158
29	165	185	203	565	-------	595	450	*642	400	*230	178	158
30	165	185	200	450	-------	505	425	535	*398	*230	178	158
31	165	-------	196	400	-------	450	-------	750	-------	*230	*178	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	200	151	168	0.202	0.23
November	230	165	180	.217	.24
December	332	192	228	.275	.32
January	1,340	192	407	.490	.56
February	785	230	320	.386	.40
March	6,730	310	888	1.07	1.23
April	7,940	400	1,570	1.89	2.11
May	17,600	425	2,620	3.16	3.64
June	3,050	398	924	1.11	1.24
July	500	230	318	.383	.44
August	700	178	313	.377	.43
September	250	158	199	.240	.27
The year	17,600	151	680	.819	11.11

* Estimated.

Digitized by Google

MERAMEC RIVER NEAR SULLIVAN, MO.

LOCATION.—Chain gage in N. ½ SW. ¼ sec. 35, T. 40 N., R. 2 W., at Sappington highway bridge, 6 miles southeast of Sullivan. Zero of gage is 582.64 feet above mean sea level.

DRAINAGE AREA.—1,550 square miles.

RECORDS AVAILABLE.—September, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 19,000 second-feet May 7 (gage height, 18.20 feet); minimum, 295 second-feet Sept. 3 (gage height, 2.28 feet).

1921–1929: Maximum discharge, 28,300 second-feet June 2, 1927 (gage height, 22.89 feet); minimum discharge, 200 second-feet Aug. 31 and Sept. 8 and 9, 1925; minimum gage height, 1.48 feet Aug. 12, 1926.

Maximum stage known, about 30.7 feet in August, 1915 (discharge, about 90,000 second-feet).

REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	364	385	535	435	810	1,240	3,460	810	1,760	668	385	303
2	364	435	535	410	750	1,120	2,300	4,650	2,090	640	435	303
3	385	435	510	410	695	93	1,830	9,230	3,000	612	410	303
4	410	435	485	385	612	870	1,310	5,350	3,150	585	385	303
5	385	435	485	435	585	870	1,180	4,150	2,650	585	385	303
6	385	410	460	535	560	810	1,120	10,600	2,300	585	410	322
7	364	385	460	535	535	810	990	18,600	2,580	560	385	385
8	364	364	435	560	535	750	3,220	14,200	2,370	585	385	385
9	364	385	435	535	510	668	7,350	5,350	1,900	560	1,380	385
10	364	385	435	560	535	640	13,600	4,350	1,570	535	1,380	342
11	364	385	460	585	535	585	8,810	3,380	1,380	510	870	342
12	342	385	460	585	585	585	4,550	3,150	1,180	1,120	870	322
13	364	385	485	535	460	560	3,150	8,310	2,580	668	810	342
14	364	385	460	510	460	535	2,510	10,900	2,370	612	695	535
15	364	410	485	485	435	640	2,930	9,510	1,900	560	612	485
16	435	410	510	485	435	4,750	4,060	5,450	1,760	640	485	460
17	435	435	612	435	435	6,530	3,460	3,300	1,440	668	435	435
18	460	535	722	460	435	3,540	2,720	3,000	1,180	640	435	385
19	485	585	870	695	460	2,440	2,090	6,420	1,120	560	410	364
20	435	560	750	930	460	1,960	1,760	4,550	960	535	385	342
21	435	510	695	870	460	1,640	1,700	3,220	930	510	385	342
22	410	485	612	810	460	1,440	1,760	2,580	870	485	385	342
23	410	435	560	722	435	1,240	1,640	2,230	870	460	364	342
24	410	435	535	750	460	1,240	1,380	1,900	870	435	342	342
25	385	410	485	1,500	460	1,120	1,240	1,760	1,240	435	342	322
26	385	385	485	2,790	668	1,570	1,240	1,640	1,570	410	342	322
27	385	385	460	2,020	1,570	1,900	1,120	1,570	1,120	410	342	322
28	385	385	460	1,500	1,500	1,380	1,050	1,570	870	385	322	322
29	385	410	435	1,240	-------	1,120	990	1,500	810	385	322	322
30	385	435	435	1,050	-------	1,120	870	1,380	750	385	303	322
31	385	-------	410	870	-------	990	-------	1,380	-------	364	303	-------

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	485	342	392	0.253	0.29
November	585	364	427	.275	.31
December	870	410	521	.336	.39
January	2,790	385	794	.512	.59
February	1,570	435	601	.388	.40
March	6,530	535	1,470	.948	1.09
April	13,600	870	2,850	1.84	2.05
May	18,600	810	5,030	3.25	3.75
June	3,150	750	1,640	1.06	1.18
July	1,120	364	551	.355	.41
August	1,380	303	506	.326	.38
September	535	303	355	.229	.26
The year	18,600	303	1,270	.819	11.10

Digitized by Google

MERAMEC RIVER NEAR EUREKA, MO.

LOCATION.—Chain gage in SE. ¼ sec. 32, T. 44 N., R. 4 E., at Votaw Ford highway bridge, 2 miles east of Eureka. Zero of gage is 407.40 feet above mean sea level.

DRAINAGE AREA.—3,800 square miles.

RECORDS AVAILABLE.—August, 1903, to July, 1906, and October, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 33,400 second-feet May 15 (gage height, 21.10 feet); minimum, 545 second-feet Sept. 4 (gage height, 0.75 foot).

1922–1929: Maximum discharge, 64,000 second-feet Apr. 3, 1927 (gage height, 29.47 feet); minimum discharge, 320 second-feet Sept. 28, 1922; minimum gage height, 0.52 foot Sept. 2, 1925.

Maximum stage known, 39.2 feet Aug. 22, 1915 (discharge, about 175,000 second-feet).

REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	635	728	830	900	1,860	3,290	10,000	*2,000	3,890	1,490	795	563
2	635	728	865	865	1,760	2,720	7,800	17,600	5,630	1,490	795	551
3	605	795	865	865	1,670	2,500	8,360	21,500	4,250	1,400	795	563
4	635	830	900	830	1,490	2,170	4,010	24,900	7,380	1,310	760	545
5	635	830	940	900	1,400	2,060	3,170	23,400	5,760	1,310	795	563
6	635	795	900	1,060	1,310	2,060	2,720	21,900	3,770	1,220	830	563
7	635	760	900	1,060	1,310	2,280	2,500	26,000	4,850	1,220	795	635
8	635	760	*868	1,060	1,220	2,060	13,500	31,100	4,730	1,140	795	665
9	635	760	865	1,140	1,220	1,760	13,600	28,800	6,280	1,140	760	695
10	635	728	830	1,310	1,140	1,580	20,300	21,300	5,760	1,140	1,490	665
11	635	728	830	1,220	1,140	1,490	24,900	8,640	3,650	1,490	2,170	665
12	575	695	795	1,220	1,140	1,400	22,200	8,080	3,290	1,670	1,960	665
13	635	695	*868	1,220	1,060	1,400	9,860	16,700	4,490	1,860	1,670	635
14	635	695	940	1,140	1,060	1,310	6,420	27,200	4,730	1,580	1,490	728
15	605	695	1,020	1,580	1 060	1,490	7,940	32,700	4,980	1,490	1,310	830
16	760	728	*1,210	2,280	1,060	6.020	9,080	27,800	3,770	2,500	1,220	865
17	940	760	1,400	1,310	1,020	13.500	7,520	10,700	3,050	4,010	980	728
18	940	795	2,170	1,140	1,060	16,100	6,020	17,900	2,270	2,060	940	760
19	900	940	1,860	1,860	1,060	15,400	5,110	19,400	2,280	1,860	865	728
20	865	980	1,760	2,170	1,060	4,850	3,890	19,000	2,170	1,490	830	695
21	830	*960	1,580	2,500	1,020	3,890	5,890	16,900	2,060	*1,360	795	665
22	795	940	1,310	2,500	1,060	3,650	4,730	10,800	1,860	1,220	760	665
23	760	900	1,220	2,060	1,060	3,050	4,010	5,500	1,580	1,140	695	635
24	728	830	1,220	1,860	1,020	2,610	3,410	4,610	2,170	1,060	695	635
25	728	795	1,140	3,890	1,140	*2,610	3,050	4,130	2,060	1,020	695	605
26	695	760	1,140	7,380	1,580	11,000	2,610	3,650	2,170	980	665	605
27	695	760	1,060	4,850	3,770	8,080	2,500	3,410	2,390	940	635	605
28	695	728	1,020	3,770	3,050	9,860	2,280	3,170	2,060	900	635	605
29	695	728	980	2,940	-------	4,610	2,170	2,940	1,860	900	605	605
30	695	760	940	2,500	-------	3,290	2,060	2,940	1,580	865	605	665
31	695	-------	900	2,170	-------	2,940	---------	2,940	-------	865	575	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	940	575	704	0.185	0.21
November	980	695	786	.207	.23
December	2,170	795	1,100	.289	.33
January	7,380	830	1,990	.524	.60
February	3,770	1,020	1,390	.366	.38
March	16,100	1,310	4,550	1.20	1.38
April	24,900	2,060	7,390	1.94	2.16
May	32,700	2,000	15,100	3.97	4.58
June	7,380	1,580	3,580	.942	1.05
July	4,010	865	1,420	.374	.43
August	2,170	575	949	.250	.29
September	865	545	653	.172	.19
The year	32,700	545	3,320	.874	11.83

* Estimated.

Digitized by Google

MERAMEC SPRING NEAR ST. JAMES, MO.

LOCATION.—Staff gage in SE. ¼ sec. 1, T. 37 N., R. 6 W., 600 feet below outlet of spring and 6 miles southeast of St. James. Zero of gage is 774.59 feet above mean sea level.

RECORDS AVAILABLE.—March, 1903, to July, 1906, and November, 1921, to October, 1929 (discontinued).

EXTREMES.—Maximum discharge during period Oct. 1, 1928, to Oct. 31, 1929, estimated (owing to backwater from Meramec River) at 350 second-feet May 7; minimum discharge, 84 second-feet Oct. 28–30, 1929; minimum gage height, 1.05 feet Jan. 4 and Feb. 11–16.

1922–1929: Maximum discharge estimated at 650 second-feet several days during 1927 and 1928; minimum, 69 second-feet Sept. 25–27, 1926.

REMARKS.—Records good except those estimated.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
1	111	104	106	*107	127	153	225	140	178	173	134	*109	94
2	111	104	*106	106	124	148	209	181	*270	167	134	*108	94
3	111	104	106	106	*122	*164	193	248	248	167	129	106	116
4	111	*104	106	104	121	181	184	222	241	161	*128	106	98
5	108	104	104	108	121	156	178	*210	222	161	127	106	98
6	108	104	104	*114	119	150	164	278	209	161	127	106	*96
7	*108	104	104	119	119	142	*160	*350	*230	*158	*200	104	94
8	108	104	104	119	119	137	252	288	*220	156	*180	*99	88
9	108	101	*106	119	116	132	302	278	*210	156	161	94	94
10	108	101	108	119	*115	*130	333	252	*200	153	150	104	94
11	108	*101	108	119	114	129	264	237	193	153	*150	104	94
12	108	101	*108	119	114	127	248	*230	190	153	150	104	225
13	106	101	108	*118	114	129	225	278	209	153	140	106	*180
14	*106	106	108	116	114	129	*218	278	209	*150	134	106	150
15	106	106	108	114	114	134	212	264	196	148	*132	*106	129
16	106	106	*112	111	114	292	215	248	*240	148	*129	*106	116
17	108	108	116	111	*116	*266	206	237	*220	148	127	106	108
18	106	*108	116	114	119	241	190	222	*200	148	*124	*105	108
19	106	108	114	*132	119	219	181	*224	*188	150	121	104	98
20	106	108	114	150	119	196	176	225	176	150	121	104	*96
21	*106	108	111	140	119	187	*172	215	173	*149	121	101	94
22	106	106	114	130	*118	178	167	206	173	148	121	*100	94
23	106	106	*111	120	116	173	164	196	*170	145	116	98	88
24	106	106	108	145	*122	*164	159	190	167	137	116	98	86
25	104	*106	*108	170	127	156	159	187	225	137	*115	98	88
26	104	106	108	160	187	178	150	*182	219	137	114	96	86
27	104	106	108	*150	181	203	150	178	196	137	*114	98	*85
28	*104	106	108	142	164	181	*146	190	193	*136	114	98	84
29	104	*106	108	134	-------	173	142	181	178	134	111	*97	84
30	104	106	*108	129	-------	167	142	*180	*176	134	111	96	84
31	106	-------	108	124	-------	160	-------	178	-------	134	111	-------	140

Month	Discharge in second-feet			Month	Discharge in second-feet		
	Maximum	Minimum	Mean		Maximum	Minimum	Mean
1928–29				June	270	167	204
October	111	104	107	July	173	134	150
November	108	101	105	August	200	111	131
December	116	104	109	September	109	94	102
January	170	104	125	The year	350	94	146
February	187	114	125	1929			
March	292	127	170	October	225	84	106
April	333	142	196				
May	350	140	225				

* Estimated.

Digitized by Google

BOURBEUSE RIVER AT UNION, MO.

LOCATION.—Chain gage in SW. ¼ sec. 26, T. 43 N., R. 1 W., 800 feet above Flat Creek and 1 mile east of Union. Zero of gage is 491.93 feet above mean sea level.

DRAINAGE AREA.—767 square miles.

RECORDS AVAILABLE.—June, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 12,400 second-feet May 21 (gage height, 13.90 feet); minimum discharge, 33 second-feet Oct. 26; minimum gage height, 1.05 feet Sept. 12.

1921–1929: Maximum discharge, 22,500 second-feet Apr. 3, 1927 (gage height, 19.10 feet); minimum discharge, 27 second-feet Sept. 20, 1925; minimum gage height, 0.80 foot Oct. 5 and 6, 1922.

Maximum stage known, 25.5 feet Aug. 22, 1915 (discharge, about 50,000 second-feet).

REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	42	51	58	65	226	875	2,740	425	1,690	185	49	39
2	45	62	55	65	226	650	4,970	4,240	3,540	146	48	40
3	45	48	51	65	226	590	5,520	7,700	1,600	120	45	40
4	55	65	58	58	212	450	1,400	10,800	2,640	100	43	41
5	46	55	46	96	198	402	960	4,540	1,310	100	43	43
6	39	48	45	100	180	590	720	4,860	758	82	48	38
7	38	55	51	110	164	795	590	7,940	875	133	43	39
8	39	45	48	105	154	620	2,070	10,900	1,080	113	40	43
9	45	42	45	180	154	475	6,080	5,300	3,740	120	48	50
10	42	44	42	241	154	340	7,940	1,400	1,880	128	49	40
11	39	55	51	256	129	304	6,880	1,040	960	116	76	36
12	36	51	48	212	115	271	2,640	1,000	590	128	340	35
13	39	45	62	198	115	271	1,690	1,130	560	300	340	43
14	51	45	69	212	120	241	1,130	6,880	720	146	137	43
15	45	48	62	212	115	271	960	9,880	1,500	133	105	40
16	39	58	65	212	110	2,640	795	2,450	685	141	105	40
17	50	62	100	212	110	8,420	720	1,400	475	128	92	46
18	51	65	100	212	96	12,200	650	3,040	380	300	79	43
19	48	62	91	271	96	2,640	530	7,460	322	430	73	43
20	48	62	82	402	86	1,500	475	10,500	288	245	64	46
21	36	62	82	1,310	86	1,080	1,400	8,420	241	162	64	46
22	36	55	82	758	86	875	1,880	1,400	212	126	52	56
23	39	55	82	560	86	720	960	960	288	122	52	40
24	46	78	91	475	82	620	875	720	425	89	45	43
25	36	65	110	475	124	475	650	590	288	84	45	41
26	33	48	105	340	134	2,740	475	450	304	78	45	40
27	45	48	96	1,310	175	6,880	425	402	560	70	50	43
28	45	51	91	960	1,220	9,380	402	380	425	64	53	41
29	45	55	86	530	-------	1,880	360	360	304	59	41	41
30	45	65	73	425	-------	1,220	322	340	226	53	36	78
31	45	-------	73	340	-------	960	-------	450	-------	52	40	-------

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	55	33	43	0.056	0.06
November	78	42	55	.072	.08
December	110	42	71	.093	.11
January	1,310	58	354	.462	.53
February	1,220	82	178	.232	.24
March	12,200	241	1,980	2.58	2.97
April	7,940	322	1,910	2.49	2.78
May	10,900	340	3,790	4.94	5.70
June	3,740	212	962	1.25	1.40
July	430	52	137	.179	.21
August	340	36	77.1	.101	.12
September	78	35	43.4	.057	.06
The year	12,200	33	805	1.05	14.26

Digitized by Google

BIG RIVER AT BYRNESVILLE, MO.

LOCATION.—Chain gage in SE. ¼ sec. 12, T. 42 N., R. 3 E., at highway bridge 200 feet below dam and mill at Byrnesville.

DRAINAGE AREA.—892 square miles.

RECORDS AVAILABLE.—May, 1922, to September, 1929.

EXTREMES.—Maximum discharge during year, 15,200 second-feet May 15 (gage height, 20.00 feet); minimum discharge, 97 second-feet Sept. 4; minimum gage height, 2.40 feet Oct. 3.

1922–1929: Maximum discharge, 21,900 second-feet Apr. 2, 1927 (gage height, 22.63 feet); minimum, 64 second-feet Oct. 1, 1922, and Aug. 12, 1926.

Maximum stage known, 30.2 feet in August, 1915 (discharge, about 80,000 second-feet).

REMARKS.—Records good for discharges above 200 second-feet and fair for those below. Slight diurnal fluctuation during low stages is caused by gristmills above.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	132	176	232	253	585	1,120	1,260	486	762	257	175	116
2	132	193	337	242	486	936	727	5,260	848	246	175	108
3	126	202	337	212	455	765	654	9,930	1,160	234	157	108
4	146	232	299	212	455	727	585	7,600	892	224	157	102
5	193	232	276	311	424	690	551	3,940	678	224	184	116
6	160	202	264	287	394	619	585	8,600	596	224	193	139
7	146	193	253	299	394	551	518	11,800	936	224	175	148
8	184	184	253	276	365	486	3,120	9,300	1,420	224	184	139
9	146	168	232	324	337	455	3,400	2,980	980	234	224	157
10	139	168	222	351	287	394	8,000	2,520	980	234	234	148
11	139	168	232	351	276	394	9,400	1,800	720	281	1,120	131
12	139	168	242	337	264	365	2,980	2,460	557	257	848	131
13	139	176	253	324	324	365	1,980	8,900	1,700	805	454	157
14	146	176	287	212	287	365	1,860	13,800	1,260	363	246	257
15	153	176	365	287	299	551	4,540	13,700	1,070	294	213	224
16	168	184	486	264	299	1,420	5,260	4,900	805	1,070	213	203
17	311	193	892	311	311	3,050	2,700	2,460	637	2,910	184	175
18	337	276	1,480	394	337	1,860	1,700	3,190	557	1,120	175	157
19	264	365	1,260	936	365	1,260	1,420	4,720	486	596	166	139
20	242	351	848	1,160	299	1,020	1,210	3,620	454	454	157	131
21	212	311	619	936	287	892	1,120	2,100	378	306	157	131
22	202	253	518	765	287	848	980	1,640	363	257	148	123
23	184	232	455	654	337	727	892	1,360	348	281	148	123
24	176	212	394	727	324	619	765	1,210	363	246	139	123
25	160	202	365	3,120	394	585	690	1,070	363	234	131	123
26	168	202	351	5,350	1,160	1,920	654	1,020	320	224	139	116
27	160	193	324	1,750	2,910	848	619	936	320	203	157	116
28	153	193	299	1,210	1,530	690	551	892	269	193	123	116
29	168	202	276	892	-------	619	518	762	234	193	123	123
30	160	193	264	765	-------	585	518	720	257	184	123	131
31	160	-------	253	690	-------	518	-------	637	-------	175	116	-------

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	337	126	176	0.197	0.23
November	365	168	213	.239	.27
December	1,480	222	425	.476	.55
January	5,350	212	781	.876	1.01
February	2,910	264	517	.580	.60
March	3,050	365	847	.950	1.10
April	9,400	518	1,990	2.23	2.49
May	13,800	486	4,330	4.85	5.59
June	1,700	234	690	.774	.86
July	2,910	175	418	.469	.54
August	1,120	116	230	.258	.30
September	257	102	140	.157	.18
The year	13,800	102	901	1.01	13.72

Digitized by Google

HEADWATER DIVERSION CHANNEL BASIN

CASTOR RIVER AT ZALMA, MO.

LOCATION.—Chain gage in S. ½ sec. 29, T. 29 N., R. 9 E., at highway bridge in Zalma. Zero of gage is 350 feet above mean sea level.

DRAINAGE AREA.—395 square miles.

RECORDS AVAILABLE.—September, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 7,250 second-feet June 14 (gage height, 21.98 feet); minimum, 56 second-feet Sept. 4 (gage height, 1.68 feet).

1921–1929: Maximum discharge, 19,400 second-feet Dec. 14, 1927 (gage height, 26.50 feet); minimum, 30 second-feet Aug. 31, 1924 (gage height, 1.10 feet).

Maximum stage known, 28.0 feet in August, 1915 (discharge, about 30,000 second-feet).

REMARKS.—Records fair. Discharge estimated Nov. 24–28 and May 26.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	198	3,050	262	600	1,460	460	244	298	146	92	60
2	63	1,210	1,560	262	520	1,110	460	406	298	146	87	57
3	66	1,310	1,090	244	480	828	442	2,120	370	158	96	57
4	164	828	828	244	442	244	784	1,330	298	152	87	57
5	105	660	806	280	424	2,430	1,020	850	262	130	87	57
6	105	660	740	298	406	1,720	740	946	228	125	87	60
7	100	442	540	280	370	1,020	600	5,980	212	158	87	96
8	96	424	480	262	370	828	540	3,890	228	152	100	78
9	87	352	580	244	334	700	2,180	4,160	228	146	125	78
10	87	334	560	370	298	620	6,120	2,210	198	140	115	70
11	82	316	540	460	280	540	2,460	1,460	177	164	120	74
12	78	280	580	460	280	540	2,120	1,160	170	140	105	87
13	78	262	600	406	298	620	1,330	1,380	2,900	125	96	146
14	70	244	1,720	334	280	2,620	1,160	1,280	7,250	115	87	170
15	78	244	1,460	388	244	2,300	2,330	2,760	3,310	125	82	135
16	1,360	660	1,160	352	244	6,190	2,270	1,670	1,410	146	78	120
17	4,110	784	2,270	352	244	3,390	1,460	1,210	1,020	560	74	105
18	1,460	1,890	4,700	700	228	1,410	1,040	1,160	720	370	70	96
19	762	1,380	2,650	4,380	228	1,040	762	806	520	262	70	96
20	520	922	1,540	1,800	228	784	620	740	442	198	70	87
21	460	640	1,110	1,540	212	600	620	640	388	152	70	82
22	388	600	874	1,380	228	560	540	520	334	152	66	82
23	388	520	540	970	198	480	560	480	298	146	63	78
24	280	464	806	4,240	212	406	424	424	280	135	63	78
25	280	408	560	6,260	228	352	500	388	298	125	63	78
26	244	352	520	6,800	4,240	316	500	397	228	120	63	78
27	280	296	442	2,690	5,050	298	406	406	198	120	63	78
28	280	240	406	1,640	2,120	262	352	388	184	115	63	78
29	244	184	370	1,260	-------	244	316	334	170	105	60	74
30	228	3,760	334	994	-------	280	262	298	158	100	60	74
31	198	-------	298	762	-------	244	-------	262	-------	92	57	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	4,110	63	413	1.05	1.21
November	3,760	184	695	1.76	1.96
December	4,700	298	1,090	2.76	3.18
January	6,800	244	1,320	3.34	3.85
February	5,050	198	689	1.74	1.81
March	6,190	244	1,110	2.81	3.24
April	6,120	262	1,110	2.81	3.14
May	5,980	244	1,300	3.29	3.79
June	7,250	158	769	1.95	2.18
July	560	92	162	.410	.47
August	125	57	80.8	.205	.24
September	170	57	85.5	.216	.24
The year	7,250	57	737	1.87	25.31

Digitized by Google

ST. FRANCIS RIVER BASIN

ST. FRANCIS RIVER FLOODWAY NEAR MARKED TREE, ARK.

LOCATION.—Staff gage in SE. ¼ sec. 10, T. 11 N., R. 6 E., at dam of Poinsett County Drainage District No. 7 near Marked Tree.

RECORDS AVAILABLE.—September, 1927, to September, 1929.

EXTREMES.—Maximum discharge during year, 15,300 second-feet May 26 (gage height, 28.7 feet); minimum, 380 second-feet Sept. 30 (gage height, 12.7 feet).

1928–29: Maximum discharge, 21,400 second-feet July 5–9, 1928 (gage height, 31.2 feet); minimum, 380 second-feet Sept. 30, 1929 (gage height, 12.7 feet).

REMARKS.—Records fair. Gage-height record furnished by Poinsett County Drainage District No. 7.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	515	2,760	2,640	8,700	10,500	6,840	8,700	11,400	13,400	3,880	1,830	530
2	440	2,640	2,640	8,700	11,400	8,500	8,700	11,200	12,600	3,620	1,620	530
3	430	2,460	2,640	8,300	12,200	8,300	8,500	11,000	11,900	3,380	1,420	530
4	640	2,230	2,760	8,100	13,100	9,120	8,300	10,700	11,200	3,040	1,280	530
5	515	2,060	2,950	7,720	13,800	10,000	8,100	10,200	10,200	2,820	1,150	455
6	470	1,900	3,080	7,180	14,300	11,000	8,100	9,780	9,340	2,550	1,000	480
7	490	1,840	3,140	6,840	14,600	11,900	8,100	9,340	8,500	2,300	910	530
8	480	1,790	3,280	6,260	14,800	12,900	8,100	8,900	8,100	2,010	880	630
9	470	1,740	3,480	5,900	14,800	13,600	8,300	9,120	7,180	1,740	880	760
10	460	1,690	3,760	5,610	14,600	14,100	8,300	9,120	6,540	1,620	880	820
11	450	1,690	3,970	5,430	14,100	14,300	8,100	9,340	6,020	1,620	1,000	820
12	440	1,690	4,250	5,160	13,600	14,600	7,900	9,780	5,710	1,580	1,320	760
13	430	1,690	4,480	4,980	13,100	14,600	7,900	10,000	5,280	1,460	1,580	730
14	430	1,740	4,720	4,890	12,600	14,300	8,100	10,200	5,120	1,460	1,830	680
15	440	1,790	4,890	4,800	12,200	14,100	8,300	10,500	4,830	1,420	2,010	630
16	450	1,740	4,980	4,720	11,400	13,800	8,500	1,1000	4,620	1,420	2,100	630
17	545	1,690	5,340	4,640	10,700	13,400	8,700	11,700	4,410	1,460	2,010	655
18	685	1,640	5,610	4,560	10,000	12,900	8,900	12,400	4,140	1,460	1,780	680
19	735	1,540	5,700	4,480	9,340	12,400	9,340	13,400	4,000	1,500	1,540	655
20	965	1,490	6,020	4,480	8,900	11,900	9,780	13,800	3,880	1,540	1,360	630
21	1,640	1,490	6,400	4,480	8,100	11,400	10,500	14,300	3,680	1,620	1,180	5-0
22	2,120	1,540	6,840	4,560	7,720	10,700	11,200	14,600	3,620	1,620	1,090	555
23	2,700	1,590	7,180	4,720	7,000	10,200	11,400	14,800	3,620	1,620	1,000	555
24	3,020	1,690	7,540	4,980	6,400	9,780	11,700	15,000	3,560	1,620	910	530
25	3,210	1,790	7,720	5,160	6,140	9,340	11,900	15,000	3,680	1,620	850	455
26	3,340	1,840	7,900	5,430	6,260	9,120	11,900	15,300	3,810	1,620	820	430
27	3,340	1,960	8,100	5,800	6,140	8,700	11,900	15,000	3,880	1,700	705	430
28	3,340	2,120	8,300	6,400	6,400	8,700	11,900	15,000	3,940	1,830	630	430
29	3,340	2,340	8,500	7,180	-------	8,700	11,700	14,800	4,000	1,960	605	405
30	3,210	2,580	8,500	8,500	-------	8,700	11,400	14,300	4,000	2,010	580	380
31	3,020	-------	8,700	9,560	-------	8,500	-------	13,800	-------	1,920	530	------

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	3,340	430	1,380	84,800
November	2,760	1,490	1,890	112,000
December	8,700	2,640	5,360	330,000
January	9,560	4,480	6,070	373,000
February	14,800	6,140	10,900	605,000
March	14,600	6,840	11,200	689,000
April	11,900	7,900	9,470	564,000
May	15,300	8,900	12,100	744,000
June	13,400	3,560	6,160	367,000
July	3,880	1,420	1,970	121,000
August	2,100	530	1,200	73,800
September	820	380	580	34,500
The year	15,300	380	5,650	4,100,000

Digitized by Google

LITTLE RIVER DITCH NO. 81 NEAR KENNETT, MO.

LOCATION.—Chain gage in NE. ¼ sec. 4, T. 18 N., R. 10 E., at bridge on State highway No. 84, 4 miles east of Kennett. Zero of gage is 240 feet above mean sea level.

RECORDS AVAILABLE.—October, 1926, to September, 1929, at present site; September, 1921, to September, 1926, at Kirk, 1¼ miles upstream.

EXTREMES.—Maximum discharge during year, 2,000 second-feet Feb. 27 (gage height, 10.88 feet); minimum, 80 second-feet Oct. 11–15 and Sept. 29 and 30. 1927–1929: Maximum discharge, 2,760 second-feet Apr. 21, 1927 (gage height, 15.11 feet); minimum discharge, 73 second-feet Sept. 17 and 18, 1927; minimum gage height, 2.61 feet Sept. 18, 1927.

REMARKS.—Records good. Discharge estimated Apr. 17 and June 10–12.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	85	154	525	223	525	1,070	337	239	184	133	96	90
2	85	170	373	207	465	924	391	223	192	120	96	85
3	90	255	287	184	409	691	319	308	184	133	96	85
4	90	239	271	192	391	779	337	271	177	133	96	85
5	90	207	355	192	319	1,250	337	239	177	120	96	96
6	90	184	337	207	287	924	319	239	170	114	96	85
7	85	177	287	223	271	691	287	485	162	114	108	114
8	85	162	255	207	271	605	271	427	192	114	108	102
9	85	154	223	207	271	585	287	605	177	114	133	96
10	85	154	223	287	287	545	355	545	175	120	177	90
11	80	147	207	355	287	391	373	427	174	120	162	90
12	80	147	207	337	271	391	545	335	172	108	140	90
13	80	140	239	271	255	337	391	355	170	108	133	96
14	80	140	391	255	255	319	391	779	271	108	120	114
15	80	140	337	223	255	355	545	950	255	108	114	96
16	90	133	287	223	255	355	713	713	207	108	114	96
17	605	192	465	223	255	319	619	545	192	184	108	90
18	525	184	1,000	255	255	303	525	465	177	184	108	90
19	337	207	713	802	255	287	303	409	162	147	108	85
20	255	177	545	1,000	239	287	287	373	154	140	102	85
21	207	170	445	605	239	271	287	337	147	126	102	85
22	184	154	409	465	223	271	373	319	147	120	96	85
23	184	147	373	409	207	255	303	271	147	120	96	85
24	223	140	337	391	223	255	271	255	140	114	96	85
25	184	140	303	1,610	355	239	255	239	147	108	90	85
26	162	140	287	1,770	1,770	239	255	239	140	108	90	85
27	170	140	271	1,400	2,000	223	239	223	133	108	90	85
28	170	140	255	1,000	1,610	223	271	223	133	102	90	85
29	162	140	192	802	------	303	255	207	133	102	90	80
30	162	319	223	691	------	391	255	192	133	96	90	80
31	154	------	223	605	------	545	------	192	------	96	90	------

Month	Discharge in second-feet			Month	Discharge in second-feet		
	Maximum	Minimum	Mean		Maximum	Minimum	Mean
October	605	80	163	May	950	192	376
November	319	133	170	June	271	133	171
December	1,000	192	350	July	184	96	120
January	1,770	184	510	August	177	90	107
February	2,000	207	454	September	114	80	90
March	1,250	223	472				
April	713	239	357	The year	2,000	80	278

Digitized by Google

LITTLE RIVER DITCH NO. 1 NEAR KENNETT, MO.

LOCATION.—Chain gage in NE. ¼ sec. 4, T. 18 N., R. 10 E., at bridge on State highway No. 84, 4 miles east of Kennett. Zero of gage is 240 feet above mean sea level.

RECORDS AVAILABLE.—October, 1926, to September, 1929, at present site; September, 1921, to September, 1926, at Kirk, 1¼ miles upstream.

EXTREMES.—Maximum discharge during year, 4,010 second-feet Feb. 27 and 28 (gage height, 11.6 feet); minimum, 49 second-feet Sept. 21, 27–31 (gage height, 2.82 feet).

1927–1929: Maximum discharge, 7,520 second-feet Apr. 25, 1927 (gage height, 16.56 feet); minimum discharge, that of Sept. 21, 27–31, 1929; minimum gage height, 2.69 feet Sept. 21–27, 1927.

REMARKS.—Records good. Discharge estimated Feb. 16 and Apr. 17.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	63	163	1,000	435	1,270	3,770	655	346	304	122	78	58
2	56	163	880	405	1,040	3,230	800	375	318	118	71	52
3	56	276	620	375	920	2,440	655	620	304	125	71	52
4	66	346	555	375	840	1,900	655	555	290	125	71	52
5	70	304	585	375	760	2,940	690	465	276	122	64	64
6	66	263	725	405	690	2,660	620	435	263	118	61	64
7	50	237	620	435	690	1,900	555	760	250	118	86	93
8	50	212	525	405	655	1,400	495	1,090	263	110	101	78
9	50	212	465	690	655	800	555	1,360	250	108	163	75
10	50	200	435	525	655	760	655	1,360	224	105	163	61
11	50	187	405	760	585	725	800	1,000	224	105	140	61
12	50	175	375	690	555	725	1,600	800	212	97	131	52
13	50	175	435	585	555	690	1,000	840	224	97	122	61
14	58	175	760	495	555	690	840	1,450	375	93	114	68
15	58	163	760	465	555	690	1,270	2,560	555	93	95	64
16	71	163	690	435	555	760	1,360	2,170	360	97	86	61
17	304	175	920	435	555	725	1,040	1,700	332	175	82	58
18	620	290	2,390	495	555	620	725	1,270	290	152	78	55
19	525	360	2,000	1,500	525	585	620	920	250	136	75	54
20	346	304	1,450	2,120	495	555	555	760	224	127	68	52
21	263	276	1,040	1,650	495	555	555	620	212	114	64	49
22	224	237	920	1,320	465	525	620	555	187	105	64	52
23	212	200	800	1,180	435	495	585	495	175	97	64	52
24	212	200	725	920	435	525	525	465	163	93	64	52
25	212	187	655	3,350	585	465	495	435	187	89	64	52
26	175	175	620	3,830	3,410	435	465	435	163	82	58	52
27	175	175	585	3,650	4,010	435	405	436	163	82	58	49
28	187	163	555	3,470	4,010	405	435	435	163	82	58	49
29	175	163	525	3,050	-------	318	405	375	152	78	58	49
30	175	405	465	2,220	-------	690	405	346	152	82	58	49
31	163	-------	435	1,650	-------	690	-------	318	-------	78	58	-------

Month	Discharge in second-feet			Month	Discharge in second-feet		
	Maximum	Minimum	Mean		Maximum	Minimum	Mean
October	620	50	157	May	2,560	318	831
November	405	163	224	June	555	152	250
December	2,390	375	772	July	175	78	107
January	3,830	375	1250	August	163	58	83.5
February	4,010	435	982	September	93	49	58.0
March	3,770	318	1,100				
April	1,600	405	701	The year	4,010	49	542

Digitized by Google

LITTLE RIVER DITCH NO. 66 NEAR KENNETT, MO.

LOCATION.—Chain gage in NE. ¼ sec. 4, T. 18 N., R. 10 E., at bridge on State highway No. 84, 4 miles east of Kennett. Zero of gage is 240 feet above mean sea level.

RECORDS AVAILABLE.—October, 1926, to September, 1928, at present site; September, 1921, to September, 1926, at Kirk, 1¼ miles upstream.

EXTREMES.—Maximum discharge during year, 2,800 second-feet Feb. 27 and 28 (gage height, 15.3 feet); minimum discharge, 65 second-feet Oct. 15 (gage height, 3.18 feet).

1927–1929: Maximum discharge, 3,650 second-feet Apr. 25, 1927 (gage height, 17.69 feet); minimum, that of Oct. 15, 1928.

REMARKS.—Records good. Discharge estimated Apr. 17. Little River ditch No. 66–A is an auxiliary to ditch No. 66, the two ditches being separated by a low, narrow bank and interconnected by cut-offs. Above stage of 6.2 feet, part of the flow is carried by ditch No. 66–A, and above stage of 13 feet the two ditches in the vicinity of the gage unite to form one continuous body of water. For the purpose of determining the discharge of each ditch, the division between them is taken at the top of the bank that separates them during low stages.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	84	235	1,350	380	1,500	2,640	596	335	380	193	122	78
2	78	235	1,450	365	1,130	2,390	648	335	365	193	115	76
3	78	380	1,050	365	910	1,940	613	477	365	193	115	74
4	90	774	850	350	720	1,400	579	528	365	193	108	71
5	96	648	720	335	666	1,970	613	460	320	193	102	77
6	84	494	930	350	596	2,200	613	444	305	180	102	78
7	78	396	850	460	579	1,880	528	666	291	180	128	122
8	78	320	684	444	562	1,450	477	1,220	291	180	148	102
9	78	291	562	396	579	1,090	477	1,290	277	180	207	102
10	74	263	494	428	545	850	684	1,330	320	180	193	96
11	69	249	428	666	511	720	1,180	1,090	291	180	263	90
12	67	249	412	666	494	648	1,330	870	277	167	207	84
13	67	221	460	579	460	613	1,070	738	277	207	180	102
14	66	221	702	494	460	613	850	1,770	596	193	160	180
15	65	207	1,010	428	460	648	850	1,770	774	180	134	154
16	84	207	890	396	460	684	1,030	1,770	810	207	128	141
17	380	494	830	396	460	738	902	1,200	702	221	122	134
18	850	870	1,740	428	477	684	774	1,030	511	277	115	115
19	792	950	2,000	702	477	596	648	792	412	277	115	102
20	528	792	1,770	1,880	444	545	562	666	350	249	108	96
21	365	596	1,200	1,940	428	528	528	596	305	221	102	96
22	305	460	970	1,850	396	511	528	528	277	180	96	96
23	277	380	792	1,740	380	528	511	477	263	167	96	90
24	291	320	648	1,350	380	511	494	444	249	160	90	90
25	305	291	579	1,940	460	477	460	412	249	154	90	90
26	263	277	545	2,680	1,660	460	428	412	221	141	90	90
27	249	263	511	2,680	2,800	428	396	684	221	141	90	90
28	249	263	477	2,570	2,800	396	396	756	221	134	84	84
29	263	249	460	2,420	-------	396	380	596	221	134	84	78
30	263	350	412	2,260	-------	545	365	494	221	134	84	78
31	249	-------	396	2,000	-------	596	-------	428	-------	122	84	-------

Month	Discharge in second-feet			Month	Discharge in second-feet		
	Maximum	Minimum	Mean		Maximum	Minimum	Mean
October	850	65	221	May	1,770	335	794
November	950	207	398	June	810	221	358
December	2,000	396	844	July	277	122	184
January	2,680	335	1,090	August	263	84	125
February	2,800	380	778	September	180	71	98.5
March	2,640	396	959				
April	1,330	365	650	The year	2,800	65	542

Digitized by Google

LITTLE RIVER DITCH NO. 66-A NEAR KENNETT, MO.

LOCATION.—Chain gage in NE. ¼ sec. 4, T. 18 N., R. 10 E., at bridge on State highway No. 84, 4 miles east of Kennett. Zero of gage is 240 feet above mean sea level.

RECORDS AVAILABLE.—January, 1927, to September, 1929.

EXTREMES.—Maximum discharge during year, 1,680 second-feet Feb. 27 and 28; maximum gage height, 15.18 feet Feb. 28; no flow on many days.

1927–1929: Maximum discharge, 2,340 second-feet Apr. 25, 1927 (gage height, 17.62 feet); no flow on many days.

REMARKS.—Records good for discharges above 20 second-feet and poor for those below. See this paragraph under Little River ditch No. 66. Discharge estimated Apr. 17.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0	0	502	0	630	1,580	21	0	0
2	0	0	608	0	308	1,340	36	0	0
3	0	0	242	0	146	1,010	28	0	0
4	0	82	124	0	60	542	27	10	0
5	0	41	67	0	47	1,030	31	0	0
6	0	4	164	0	24	1,290	26	0	0
7	0	0	115	0	15	956	13	41	0
8	0	0	53	0	14	586	1	422	0
9	0	0	18	0	15	274	1	442	0
10	0	0	2	0	11	134	53	502	0
11	0	0	0	41	7	53	362	308	0
12	0	0	0	41	3	41	482	129	0
13	0	0	0	19	0	31	274	78	0
14	0	0	60	2	0	28	120	170	24
15	0	0	212	0	0	34	120	860	90
16	0	0	134	0	0	53	226	860	106
17	0	4	106	0	0	70	156	382	56
18	120	129	860	0	0	53	86	242	7
19	98	170	1,110	290	1	28	41	98	0
20	12	90	860	956	0	15	18	50	0
21	0	30	362	1,010	0	11	9	26	0
22	0	0	184	932	0	8	10	9	0
23	0	0	82	836	0	10	8	1	0
24	0	0	38	502	0	7	3	0	0
25	0	0	24	1,010	0	1	0	0	0
26	0	0	12	1,600	764	0	0	0	0
27	0	0	7	1,580	1,680	0	0	47	0
28	0	0	1	1,530	1,680	0	0	78	0
29	0	0	0	1,420	-------	0	0	26	0
30	0	0	0	1,270	-------	15	0	2	0
31	0	-------	0	1,060	-------	30	-------	0	-------

Month	Discharge in second-feet			Month	Discharge in second-feet		
	Maximum	Minimum	Mean		Maximum	Minimum	Mean
October	120	0	7.42	March	1,580	0	298
November	170	0	18.3	April	482	0	71.7
December	1,110	0	192	May	860	0	154
January	1,600	0	455	June	106	0	9.43
February	1,680	0	193				

NOTE.—No flow during July, August, and September.

Digitized by Google

LITTLE RIVER DITCH NO. 251 NEAR KENNETT, MO.

LOCATION.—Chain gage in NW. ¼ sec. 3, T. 18 N., R. 10 E., at bridge on State highway No. 84, 4 miles east of Kennett. Zero of gage is 240 feet above mean sea level.

RECORDS AVAILABLE.—November, 1926, to September, 1929.

EXTREMES.—Maximum discharge during year, 5,020 second-feet Feb. 28 (gage height, 15.37 feet); minimum discharge, 156 second-feet Sept. 4 and 28–30; minimum gage height, 2.90 feet Sept. 4.

1927–1929: Maximum discharge, 6,510 second-feet Apr. 24 and 25, 1927 (gage height, 17.67 feet); minimum discharge, 134 second-feet Nov. 14, 1926; minimum gage height, that of Sept. 4, 1929.

REMARKS.—Records good. Discharge estimated Apr. 17.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	192	420	2,520	748	2,780	4,780	1,160	645	720	362	220	163
2	192	420	2,700	696	2,160	4,300	1,280	645	696	340	220	163
3	192	645	2,040	670	1,760	3,580	1,160	852	696	362	211	163
4	201	1,350	1,560	670	1,380	2,600	1,160	932	672	362	202	156
5	210	1,100	1,320	670	1,250	3,640	1,350	826	600	340	194	163
6	192	878	1,720	670	1,130	4,080	1,160	774	576	318	194	170
7	192	696	1,560	826	1,070	3,520	1,020	1,220	552	318	238	220
8	192	570	1,250	800	1,040	2,700	932	2,290	552	318	256	202
9	183	520	1,040	748	1,070	1,960	904	2,420	504	318	362	194
10	183	495	904	826	1,020	1,600	1,320	2,470	552	318	362	186
11	174	470	826	1,220	960	1,350	2,160	2,040	528	408	456	178
12	174	445	774	1,220	904	1,220	2,470	1,560	504	318	362	170
13	174	420	878	1,040	878	1,160	1,960	1,350	504	362	318	186
14	174	420	1,520	878	852	1,130	1,560	1,680	1,050	318	276	276
15	174	395	1,920	800	852	1,190	1,640	3,280	1,380	318	238	256
16	192	395	1,640	748	852	1,380	1,880	3,280	1,460	362	238	238
17	645	774	1,840	722	852	1,420	1,630	2,200	1,220	408	220	220
18	1,560	1,520	3,180	774	878	1,280	1,380	1,880	892	480	220	211
19	1,420	1,680	3,750	2,040	878	1,130	1,220	1,490	744	480	211	186
20	932	1,350	3,230	3,430	826	1,020	1,070	1,280	648	432	202	178
21	645	1,020	2,240	3,580	800	960	1,020	1,130	576	362	194	178
22	545	800	1,840	3,430	748	932	1,040	1,020	528	318	194	170
23	470	670	1,490	3,230	722	932	988	944	504	296	186	163
24	570	595	1,280	2,520	696	1,420	932	866	456	276	186	163
25	545	545	1,130	3,520	878	1,130	826	816	456	276	186	170
26	495	520	1,040	4,840	3,130	722	826	792	432	256	178	163
27	445	495	988	4,720	4,960	748	748	1,190	408	256	178	163
28	445	470	932	4,600	5,020	722	774	1,320	408	238	170	156
29	470	470	878	4,420	-------	722	748	1,050	384	238	170	156
30	470	696	800	4,080	-------	1,190	696	892	384	238	170	156
31	445	-------	774	3,700	-------	1,220	-------	792	-------	220	170	-------

Month	Discharge in second-feet			Month	Discharge in second-feet		
	Maximum	Minimum	Mean		Maximum	Minimum	Mean
October	1,560	174	422	May	3,280	645	1,420
November	1,680	395	708	June	1,460	384	653
December	3,750	774	1,600	July	480	220	330
January	4,840	670	2,030	August	456	170	232
February	5,020	696	1,440	September	276	156	184
March	4,780	722	1,800				
April	2,470	696	1,230	The year	5,020	156	1,000

Digitized by Google

LITTLE RIVER DITCH NO. 250 NEAR KENNETT, MO.

LOCATION.—Chain gage in NW. ¼ sec. 3, T. 18 N., R. 10 E., at bridge on State highway No. 84, 4 miles east of Kennett. Zero of gage is 240 feet above mean sea level.

RECORDS AVAILABLE.—November, 1926, to September, 1929.

EXTREMES.—Maximum discharge during year, 1,330 second-feet Feb. 26 and 27 (gage height, 9.4 feet); minimum discharge, 5 second-feet Oct. 1 and Sept. 12; minimum gage height, 1.60 feet Sept. 12.

1927–1929: Maximum discharge, 4,140 second-feet Apr. 29, 1927 (gage height, 15.57 feet); minimum discharge and gage height, those given above.

REMARKS.—Records fair. Discharge estimated Apr. 17.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5	28	199	127	238	815	308	153	79	27	16	6
2	6	34	175	118	199	533	336	164	76	26	16	6
3	6	48	142	113	175	366	252	153	76	26	16	6
4	6	62	132	108	175	450	336	142	72	26	14	6
5	7	58	153	118	164	740	336	142	65	24	14	7
6	7	51	153	122	153	648	252	187	58	24	14	6
7	7	48	132	118	153	414	199	294	58	24	14	11
8	7	44	122	113	153	322	164	336	51	21	15	8
9	7	41	113	108	153	252	225	717	51	21	19	7
10	7	38	108	175	153	212	280	602	48	22	20	7
11	6	36	100	199	142	187	366	398	48	21	38	6
12	6	36	100	164	132	175	414	294	44	21	33	5
13	6	34	187	153	132	164	280	199	51	21	27	6
14	6	36	322	132	132	175	238	238	100	19	22	6
15	6	36	252	127	132	175	450	579	104	21	17	8
16	10	35	199	127	142	212	366	450	95	21	15	8
17	30	34	579	127	142	187	282	294	83	30	14	7
18	58	58	840	175	132	164	199	252	68	38	14	7
19	54	65	694	336	132	153	175	252	58	33	13	6
20	41	58	460	336	132	142	153	322	51	30	12	6
21	34	54	308	266	127	132	175	238	44	26	11	6
22	32	44	266	252	122	127	238	175	44	24	11	6
23	27	41	225	225	118	132	187	142	38	23	10	6
24	30	41	199	225	127	122	153	122	37	21	9	6
25	30	38	175	740	322	118	142	113	41	20	8	6
26	28	38	175	717	1,330	113	132	142	38	18	8	6
27	29	37	164	510	1,330	113	118	132	36	18	8	6
28	28	38	153	450	1,120	108	199	122	34	17	7	6
29	29	33	142	366	.....	153	280	104	31	17	7	6
30	29	104	132	308	.....	398	199	91	31	16	7	6
31	28	.....	132	280	.....	322	.....	83	.....	16	7	.....

Month	Discharge in second-feet			Month	Discharge in second-feet		
	Maximum	Minimum	Mean		Maximum	Minimum	Mean
October	58	5	19.7	May	717	83	246
November	104	28	44.9	June	104	31	57.0
December	840	100	233	July	38	16	23.0
January	740	108	240	August	38	7	14.7
February	1,330	118	274	September	11	5	6.5
March	815	108	269				
April	450	118	248	The year	1,330	5	139

Digitized by Google

BIG LAKE OUTLET NEAR MANILA, ARK.

LOCATION.—Chain gage in SE. ¼ sec. 9, T. 14 N., R. 9 E., 3½ miles southeast of Manila.

RECORDS AVAILABLE.—September, 1927, to September, 1929.

EXTREMES.—Maximum discharge during year, 10,600 second-feet Mar. 6 (gage height, 16.89 feet); minimum, 510 second-feet Sept. 26–30 (gage height, 4.10 feet).

1928–29: Maximum discharge, 15,700 second-feet July 5, 1928 (gage height, 19.7 feet); minimu n, 510 second-feet Sept. 26–30, 1929 (gage height, 4.10 feet).

REMARKS.—Records good. Discharge interpolated Apr. 11 and June 23. Gage-height record furnished by Mississippi County Drainage District No. 17.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	595	1,750	1,850	4,370	10,100	7,230	3,820	4,180	4,000	1,550	910	575
2	595	1,750	2,000	4,120	9,780	8,590	3,880	4,120	3,820	1,450	865	575
3	685	1,850	2,350	3,880	9,480	9,630	4,060	4,060	3,580	1,400	820	540
4	685	1,850	2,850	3,640	9,030	10,100	4,240	3,880	3,340	1,350	775	540
5	820	1,950	3,700	3,400	8,590	10,400	4,510	3,880	3,100	1,350	730	540
6	775	2,150	3,880	3,280	7,890	10,600	4,650	3,880	2,950	1,250	775	575
7	775	2,150	3,880	3,160	7,490	10,300	4,730	3,880	2,800	1,200	775	645
8	685	2,250	3,760	3,000	6,980	9,780	4,730	4,000	2,700	1,200	775	775
9	685	2,250	3,760	2,950	6,500	9,330	4,730	4,440	2,500	1,200	955	775
10	640	2,150	3,820	2,900	6,060	8,590	4,650	4,970	2,300	1,200	1,150	775
11	595	2,050	3,880	2,950	5,760	7,890	4,730	5,660	2,150	1,200	1,350	685
12	595	1,950	3,880	2,950	5,300	7,230	4,810	6,060	2,050	1,200	1,550	685
13	550	1,850	3,880	3,100	5,130	6,740	5,210	6,280	2,050	1,250	1,600	645
14	550	1,750	3,880	3,100	4,810	6,170	5,660	6,280	2,050	1,250	1,600	685
15	550	1,650	3,880	3,100	4,510	5,860	5,760	6,500	2,050	1,200	1,500	730
16	865	1,650	3,940	3,160	4,300	5,570	5,960	6,740	2,150	1,250	1,450	685
17	1,100	1,750	4,120	3,050	4,120	5,390	5,960	7,100	2,350	1,350	1,300	645
18	1,400	1,750	4,370	2,950	4,000	5,130	6,060	7,360	2,550	1,450	1,100	610
19	1,800	1,850	4,650	3,050	3,880	5,050	5,860	7,360	2,550	1,550	955	610
20	2,200	2,150	5,480	3,220	3,700	4,810	5,660	7,230	2,550	1,550	910	610
21	2,350	2,250	6,060	3,880	3,640	4,580	5,480	6,740	2,400	1,500	865	610
22	2,550	2,400	6,390	4,440	3,520	4,370	5,210	6,500	2,250	1,400	820	575
23	2,550	2,400	6,500	4,970	3,340	4,240	5,050	6,170	2,120	1,350	775	540
24	2,450	2,350	6,500	5,480	3,520	4,120	4,890	5,760	2,000	1,300	730	540
25	2,350	2,250	6,280	5,860	3,880	4,580	4,730	5,480	1,950	1,150	730	540
26	2,250	2,150	6,060	6,500	4,000	3,820	4,440	5,210	1,900	1,100	685	510
27	2,150	2,050	5,760	7,490	4,240	3,700	4,300	4,890	1,800	1,050	685	510
28	2,050	1,950	5,480	8,450	5,480	3,700	4,240	4,810	1,650	1,000	645	510
29	2,000	1,850	5,210	9,180	-------	3,640	4,180	4,650	1,550	955	610	510
30	1,950	1,850	4,890	9,630	-------	3,580	4,180	4,440	1,550	955	610	510
31	1,850	-------	4,650	10,100	-------	3,580	-------	4,240	-------	955	610	------

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	2,550	550	1,340	82,400
November	2,400	1,650	2,000	119,000
December	6,500	1,850	4,440	273,000
January	10,100	2,900	4,560	280,000
February	10,100	3,340	5,680	315,000
March	10,600	3,580	6,400	394,000
April	6,060	3,820	4,880	290,000
May	7,360	3,880	5,390	331,000
June	4,000	1,550	2,430	145,000
July	1,550	955	1,260	77,500
August	1,600	610	955	58,700
September	775	510	609	36,200
The year	10,600	510	3,320	2,400,000

Digitized by Google

WHITE RIVER BASIN

WHITE RIVER AT BEAVER, ARK.

LOCATION.—Chain gage in sec. 20, T. 21 N., R. 26 W., at Missouri & North Arkansas Railroad bridge one-fourth mile east of depot at Beaver. Zero of gage is 885.55 feet above mean sea level.

DRAINAGE AREA.—1,270 square miles.

RECORDS AVAILABLE.—July, 1909, to December, 1910, and May, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, 33,900 second-feet Jan. 26 (gage height, 23.85 feet); minimum, 93 second-feet Sept. 30 (gage height, 2.69 feet). 1909–10, 1923–1929: Maximum discharge, 65,000 second-feet Apr. 16, 1927 (gage height, 37.0 feet); minimum discharge, 33 second-feet Sept. 10, 1925; minimum gage height, 1.55 feet (transferred to datum of gage used 1923–1929) Oct. 1–8, 1909.

REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	121	130	595	420	2,060	3,840	2,470	2,580	3,050	1,080	302	112
2	121	135	1,080	395	1,760	3,170	5,750	2,810	7,140	1,080	281	110
3	121	135	842	370	1,570	2,690	3,840	5,450	6,350	3,560	273	107
4	121	140	800	347	1,390	2,360	3,560	4,700	15,500	7,300	254	105
5	135	161	730	1,160	1,300	2,060	2,930	3,300	10,400	3,050	235	125
6	128	167	595	2,810	1,160	1,960	2,470	4,700	6,660	2,060	228	142
7	130	161	565	6,200	1,080	1,960	2,060	3,700	6,820	2,260	222	215
8	150	150	535	3,170	1,040	1,760	3,840	7,460	5,900	20,100	235	184
9	138	145	475	2,360	960	1,570	11,100	20,500	6,820	20,300	302	170
10	130	140	448	1,960	920	1,390	22,700	20,500	3,980	5,450	215	148
11	130	138	395	1,960	880	1,210	11,000	7,940	3,430	3,560	265	140
12	125	130	370	1,760	800	1,120	6,200	9,410	2,580	2,690	232	187
13	121	130	535	1,480	842	1,120	4,400	9,240	2,160	2,060	228	302
14	116	130	565	1,210	800	4,550	6,820	7,620	6,820	1,660	215	250
15	114	161	2,690	1,040	842	3,700	16,700	6,660	4,260	1,390	199	228
16	128	302	2,160	960	842	5,900	12,600	5,300	2,580	1,210	184	190
17	132	347	3,300	880	960	5,900	6,820	5,000	1,960	1,080	178	167
18	135	660	6,500	880	1,080	3,840	6,820	4,700	1,570	960	170	145
19	156	960	5,450	880	1,480	2,930	7,620	7,300	1,300	880	167	130
20	184	842	3,050	1,480	1,660	2,360	8,740	5,750	1,160	800	161	125
21	170	628	2,160	1,390	1,570	2,160	6,820	3,980	1,040	730	153	121
22	156	505	1,660	1,210	1,480	2,160	5,300	3,050	1,040	660	150	112
23	145	420	1,390	1,040	1,570	1,960	4,120	2,470	1,160	595	145	110
24	140	370	1,120	3,980	1,760	1,660	3,300	2,160	12,600	535	135	107
25	135	324	920	19,600	2,580	1,480	2,810	1,860	5,600	475	145	103
26	128	302	800	29,300	4,700	1,300	4,120	1,860	5,450	448	142	101
27	130	273	695	8,100	8,260	1,160	3,430	5,900	3,050	420	138	99
28	125	258	628	5,300	5,150	1,120	2,690	10,100	2,060	420	125	97
29	125	370	565	3,840	-------	2,060	4,400	9,410	1,570	370	120	95
30	121	475	505	2,930	-------	3,430	3,430	6,350	1,300	347	116	95
31	116	-------	475	2,360	-------	3,170	-------	3,980	-------	324	114	-------

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	184	114	133	0.105	0.12	8,180
November	960	130	306	.241	.27	18,200
December	6,500	370	1,370	1.08	1.24	84,200
January	29,300	347	3,570	2.81	3.24	220,000
February	8,260	800	1,800	1.42	1.48	100,000
March	5,900	1,120	2,490	1.96	2.26	153,000
April	22,700	2,060	6,300	4.96	5.53	375,000
May	20,500	1,860	6,310	4.97	5.73	388,000
June	15,500	1,040	4,510	3.55	3.96	268,000
July	20,300	324	2,830	2.23	2.57	174,000
August	302	114	194	.153	.18	11,900
September	302	95	144	.113	.13	8,570
The year	29,300	95	2,500	1.97	26.71	1,810,000

Digitized by Google

WHITE RIVER NEAR FLIPPIN, ARK.

LOCATION.—Staff gage in NW. ¼ sec. 9, T. 19 N., R. 15 W., 2½ miles north of Flippin. Zero of gage is 423.52 feet above mean sea level.
DRAINAGE AREA.—6,170 square miles.
RECORDS AVAILABLE.—October, 1928, to September, 1929.
EXTREMES.—Maximum discharge during year, 70,400 second-feet May 9 (gage height, 23.80 feet); minimum, 292 second-feet Aug. 27 (gage height, 4.44 feet).
REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,190	820	4,440	2,510	9,450	20,100	5,920	10,300	18,700	5,260	1,600	563
2	1,360	820	3,680	3,860	8,090	16,500	6,610	11,500	12,800	4,240	1,800	590
3	1,420	820	2,990	2,210	7,330	13,100	7,330	15,800	23,200	4,050	920	680
4	920	820	2,670	2,360	6,850	10,900	7,090	17,600	32,900	3,500	1,480	1,600
5	870	870	2,510	3,160	6,380	9,730	8,890	19,800	27,100	4,640	1,300	635
6	1,190	870	5,920	8,350	5,700	7,580	7,830	18,000	28,700	8,090	1,300	770
7	1,540	680	4,050	7,830	4,640	8,090	7,830	16,500	20,100	6,380	1,080	1,140
8	1,300	820	3,680	9,170	3,860	7,830	14,900	32,100	35,500	5,060	1,360	1,020
9	870	870	3,860	12,400	4,440	7,330	45,300	68,900	31,600	5,260	1,420	970
10	920	920	3,500	10,000	5,700	7,090	58,900	65,900	24,300	19,200	1,360	970
11	870	920	2,830	8,890	5,480	6,380	63,400	63,900	19,800	19,400	1,800	920
12	870	920	2,510	7,830	3,160	5,920	49,100	39,600	14,400	5,920	1,800	970
13	970	680	3,160	7,330	4,440	5,920	27,100	34,700	11,800	4,640	1,600	2,360
14	970	680	7,330	6,380	4,240	5,700	22,800	49,100	12,800	5,920	1,420	*2,990
15	970	870	8,350	6,380	3,500	6,610	29,100	42,900	12,100	5,260	1,800	3,500
16	770	1,360	7,090	6,150	2,670	13,400	33,800	31,200	15,500	4,440	1,540	2,070
17	870	1,670	10,000	5,480	3,680	14,100	36,000	23,900	11,800	2,990	1,140	1,300
18	1,360	2,990	18,700	4,240	2,510	14,400	25,900	19,400	8,620	2,210	1,240	920
19	1,020	3,500	18,700	4,640	4,050	14,100	20,900	19,800	7,330	1,800	1,020	870
20	1,020	2,210	18,700	5,480	4,440	10,900	24,700	20,100	6,610	2,670	770	1,080
21	920	2,830	15,100	3,680	5,260	10,000	31,600	23,200	5,700	2,510	820	770
22	770	3,160	11,200	5,480	5,920	8,620	36,000	18,000	5,480	2,210	970	680
23	680	2,670	8,620	5,480	6,150	7,330	25,100	14,400	5,480	2,070	970	820
24	970	2,830	7,830	22,600	6,150	6,610	17,600	11,800	5,480	2,070	770	590
25	870	2,210	6,380	35,500	7,580	6,380	16,200	10,000	13,100	2,360	590	518
26	920	2,070	5,050	40,500	17,600	6,150	13,800	11,500	10,000	1,670	554	563
27	920	2,210	4,840	51,000	23,900	5,920	12,100	14,400	9,450	1,480	572	554
28	870	2,070	5,480	41,000	23,600	5,480	12,100	37,300	8,890	1,600	770	680
29	920	2,070	4,050	20,100	-------	5,700	10,600	23,200	6,850	1,540	680	770
30	920	3,860	2,990	14,400	-------	5,050	10,000	26,300	5,700	1,480	590	590
31	870	-------	2,510	11,500	-------	5,700	-------	20,900	-------	1,600	635	-------

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	1,540	680	997	0.162	0.19	61,300
November	3,860	680	1,670	.271	.30	99,400
December	18,700	2,510	6,730	1.09	1.26	414,000
January	51,000	2,210	12,100	1.96	2.26	744,000
February	23,900	2,510	7,030	1.14	1.19	390,000
March	20,100	5,050	8,990	1.45	1.67	553,000
April	63,400	5,920	23,000	3.73	4.16	1,370,000
May	68,900	10,000	26,800	4.34	5.00	1,650,000
June	35,500	5,480	15,100	2.45	2.73	898,000
July	19,400	1,480	4,560	.739	.85	280,000
August	1,800	554	1,150	.186	.21	70,700
September	3,500	518	1,060	.175	.20	64,300
The year	68,900	518	9,100	1.47	20.02	6,590,000

Digitized by Google

WHITE RIVER NEAR NEWPORT, ARK.

LOCATION.—Chain gage on line between secs. 16 and 17, T. 11 N., R. 3 W., on Missouri Pacific Railroad bridge 2½ miles southwest of Newport.
DRAINAGE AREA.—19,800 square miles.
RECORDS AVAILABLE.—September, 1927, to September, 1929.
EXTREMES.—Maximum discharge during year, 108,000 second-feet May 12, 13 (gage height, 30.0 feet); minimum, 6,000 second-feet Sept. 28–30 (gage height, 3.95 feet).

1928–1929: Maximum discharge, 163,000 second-feet June 25, 1928 (gage height, 32.8 feet); minimum, 6,000 second-feet Sept. 28–30, 1929 (gage height, 3.95 feet).

Maximum stage known, 36.1 feet April, 1927.
REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7,600	7,600	19,000	21,800	82,100	72,100	35,300	62,200	69,200	21,300	9,150	6,600
2	7,420	8,680	21,500	18,800	75,700	73,400	37,800	59,800	65,200	18,900	9,150	6,450
3	7,600	14,000	23,400	17,000	70,800	72,600	40,400	61,800	60,700	17,300	9,750	6,300
4	8,320	15,500	24,000	16,700	66,600	71,200	40,400	63,000	55,600	16,700	8,850	6,300
5	9,230	14,200	21,500	15,800	63,000	71,600	39,600	63,000	57,000	15,800	8,400	6,300
6	9,420	12,800	19,300	14,900	60,200	68,600	41,100	62,600	60,200	15,100	8,100	6,300
7	9,610	11,400	18,800	14,600	57,500	66,200	41,900	63,000	58,800	14,500	8,100	6,600
8	9,040	10,600	19,600	22,100	54,800	63,800	41,900	63,000	57,800	16,000	7,950	6,600
9	8,320	10,600	18,500	22,700	52,400	60,600	47,500	69,000	58,300	19,300	7,800	6,750
10	7,960	9,860	17,500	25,600	49,800	58,600	69,000	82,600	63,200	25,000	8,100	6,900
11	7,780	9,230	16,500	28,500	47,500	52,400	82,600	98,000	62,700	20,500	9,000	6,900
12	7,600	9,040	16,200	28,500	45,600	54,000	94,300	108,000	58,300	30,600	9,900	6,600
13	7,420	8,860	15,800	27,200	43,000	52,000	102,000	108,000	53,400	31,000	10,600	6,600
14	7,240	8,680	22,700	25,600	38,500	50,500	103,000	101,000	48,800	24,200	11,400	6,600
15	7,240	8,500	25,900	23,700	33,900	48,600	96,100	96,100	45,500	19,300	11,700	7,350
16	7,240	7,780	31,500	21,800	30,100	48,200	93,400	96,100	45,100	16,900	11,000	8,100
17	10,200	7,780	35,700	21,000	26,900	49,000	92,600	95,200	43,100	14,900	10,200	8,100
18	14,900	7,960	43,700	20,100	24,000	52,400	91,800	90,200	42,700	14,300	9,750	8,250
19	15,500	10,800	48,600	28,200	22,400	53,200	90,200	83,600	39,500	13,100	9,150	7,500
20	13,200	11,800	54,000	32,800	21,200	53,200	86,800	78,900	35,900	12,200	9,000	6,900
21	11,200	12,800	55,100	34,200	21,200	52,400	85,600	75,600	32,700	11,400	8,400	6,600
22	10,200	12,400	55,100	34,600	21,800	50,100	87,400	74,500	28,500	11,100	7,950	6,450
23	9,610	12,000	53,600	33,600	22,400	47,700	89,500	73,400	25,500	11,000	7,650	6,450
24	9,040	11,600	49,800	32,800	23,400	45,200	88,800	70,700	22,800	10,600	7,500	6,300
25	9,040	11,000	45,200	54,000	25,900	43,000	85,000	67,700	24,000	10,200	7,500	6,150
26	8,500	10,800	41,100	75,700	42,600	40,400	80,600	64,200	23,800	9,900	7,350	6,150
27	8,140	10,600	37,100	91,000	61,800	37,800	75,700	61,200	22,500	9,750	7,200	6,000
28	7,960	10,200	32,800	99,000	69,800	36,000	71,600	59,200	25,800	9,450	6,900	6,000
29	7,960	9,990	30,100	102,000	-------	34,200	68,200	63,700	25,200	9,150	6,900	6,000
30	7,960	12,000	27,500	99,000	-------	40,000	65,000	71,800	23,500	9,000	6,600	6,000
31	7,780	-------	24,600	89,500	-------	36,000	-------	70,700	-------	8,850	6,600	-------

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	15,500	7,240	9,040	0.457	0.53	556,000
November	15,500	7,600	10,600	.535	.60	631,000
December	55,100	15,800	31,200	1.58	1.82	1,920,000
January	102,000	14,600	38,500	1.94	2.24	2,370,000
February	82,100	21,200	44,800	2.26	2.35	2,490,000
March	73,400	34,200	53,400	2.70	3.11	3,280,000
April	103,000	35,300	72,200	3.65	4.07	4,300,000
May	108,000	59,200	76,100	3.84	4.43	4,680,000
June	69,200	22,500	44,500	2.25	2.51	2,650,000
July	31,000	8,850	15,700	.793	.91	965,000
August	11,700	6,600	8,630	.436	.50	531,000
September	8,250	6,000	6,670	.337	.38	397,000
The year	108,000	6,000	34,200	1.73	23.45	24,800,000

Digitized by Google

WHITE RIVER AT DE VALLS BLUFF, ARK.

LOCATION.—Staff gage in sec. 23, T. 2 N., R. 4 W., 1 mile northeast of De Valls Bluff and 27 miles above mouth of Cache River. Zero of gage is 152.67 feet above mean sea level.

DRAINAGE AREA.—23,500 square miles.

RECORDS AVAILABLE.—December, 1927, to September, 1929.

EXTREMES.—Maximum discharge during year, 113,000 second-feet May 19, 20 (gage height, 26.8 feet); minimum, 6,570 second-feet Sept. 30 (gage height, 6.3 feet).

1928–29: Maximum discharge, 140,000 second-feet June 28, 29, 1928 (gage height, 28.5 feet); minimum, 6,570 second-feet Sept. 30, 1929 (gage height, 6.3 feet).

Maximum stage known, 33.8 feet Apr. 24, 1927.

REMARKS.—Records good. Gage-height record furnished by United States Weather Bureau.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7,970	8,430	11,000	39,300	73,400	41,800	44,400	95,200	64,100	31,100	11,000	7,530
2	7,860	8,560	15,200	37,300	83,600	44,400	45,200	90,800	64,100	30,100	10,800	7,420
3	7,750	8,820	18,800	33,900	88,000	46,100	45,200	86,500	64,100	28,100	10,600	7,310
4	7,750	9,730	20,300	31,100	90,800	51,100	45,200	80,700	64,100	26,200	10,500	7,200
5	7,860	11,900	21,000	27,600	89,400	56,600	44,400	76,400	64,100	24,000	10,400	7,110
6	7,970	13,700	21,400	25,100	86,500	62,800	44,400	73,400	62,800	22,700	10,200	7,020
7	8,190	14,300	21,200	23,100	82,200	68,000	43,600	69,400	61,400	21,400	9,990	6,930
8	8,690	14,000	20,500	22,000	77,800	72,000	43,600	66,700	61,400	20,300	9,860	6,840
9	9,080	13,300	19,900	21,800	73,400	72,000	43,600	66,700	61,400	19,400	9,600	6,930
10	9,080	12,400	19,400	23,100	69,400	72,000	53,300	66,700	61,400	18,900	9,340	7,020
11	8,820	11,700	18,900	24,000	62,800	69,400	43,600	66,700	60,100	19,700	9,210	7,110
12	8,430	11,200	18,500	25,800	58,800	66,700	44,400	68,000	60,100	21,000	9,080	7,110
13	8,190	10,600	18,300	27,200	55,500	64,100	47,000	72,000	60,100	21,800	9,470	7,200
14	7,970	10,100	18,600	28,100	53,300	61,400	52,200	80,700	58,800	23,100	10,100	7,110
15	7,750	9,860	20,700	28,100	50,000	57,700	62,800	90,800	57,700	24,400	10,900	7,110
16	7,640	9,470	24,000	28,100	47,800	55,500	76,400	101,000	55,500	24,400	12,000	7,020
17	8,080	9,210	30,100	27,600	46,100	53,300	86,500	107,000	54,400	23,600	12,300	7,200
18	7,970	8,950	36,000	26,900	44,400	51,100	93,800	112,000	52,200	22,200	12,400	7,530
19	8,820	8,820	38,600	26,500	41,800	50,000	99,600	113,000	50,000	20,800	12,200	7,970
20	10,900	9,210	41,000	27,600	39,300	48,900	101,000	113,000	47,800	19,100	11,600	8,300
21	12,700	10,200	43,600	30,600	37,300	47,800	102,000	112,000	46,100	18,000	11,000	8,300
22	13,000	11,300	45,200	32,600	34,600	47,800	104,000	108,000	45,200	16,700	10,600	7,970
23	12,600	12,000	46,100	33,900	32,100	47,000	104,000	104,000	43,600	15,500	10,100	7,640
24	11,700	12,400	46,100	35,300	31,100	47,000	102,000	99,600	42,700	14,600	9,600	7,310
25	10,900	12,400	46,100	37,300	30,100	47,000	104,000	93,800	41,000	13,800	9,210	7,110
26	10,400	12,200	46,100	38,600	32,600	47,000	104,000	89,400	47,800	13,300	8,820	6,930
27	9,860	11,900	45,200	40,200	36,000	46,100	102,000	85,000	37,300	12,700	8,560	6,840
28	9,470	11,600	45,200	42,700	38,600	46,100	101,000	80,700	36,000	12,300	8,300	6,750
29	9,080	11,300	45,200	46,100	-------	44,400	99,600	76,400	33,900	11,900	8,080	6,660
30	8,820	11,000	44,400	51,100	-------	44,400	95,200	70,700	32,600	11,700	7,970	6,570
31	8,560	-------	41,800	61,400	-------	44,400	-------	68,000	-------	11,300	7,750	-------

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	13,000	7,640	9,160	0.390	0.45	563,000
November	14,300	8,430	11,000	.468	.52	655,000
December	46,100	11,000	30,600	1.30	1.50	1,880,000
January	61,400	21,800	32,400	1.38	1.59	1,990,000
February	90,800	30,100	56,700	2.41	2.51	3,150,000
March	72,000	41,800	54,000	2.30	2.65	3,320,000
April	104,000	43,600	72,600	3.09	3.45	4,320,000
May	113,000	66,700	86,600	3.69	4.25	5,320,000
June	64,100	32,600	53,100	2.26	2.52	3,160,000
July	31,100	11,300	19,800	.843	.97	1,220,000
August	12,400	7,750	10,000	.425	.49	615,000
September	8,300	6,570	7,240	.308	.34	431,000
The year	113,000	6,570	36,800	1.57	21.24	26,600,000

Digitized by Google

JAMES RIVER NEAR BATTLEFIELD, MO.

LOCATION.—Vertical staff gage near center of sec. 27, T. 28 N., R. 22 W., 1,500 feet above Inniman Branch and 2½ miles southeast of Battlefield. Zero of gage is approximately 1,175 feet above mean sea level.

DRAINAGE AREA.—306 square miles.

RECORDS AVAILABLE.—February, 1926, to May, 1929.

EXTREMES.—Maximum discharge during period Oct. 1 to May 31, 8,010 second-feet Apr. 9 (gage height, 11.20 feet); minimum, 25 second-feet Oct. 28 (gage height, 1.43 feet).

1926–1929: Maximum discharge, 16,200 second-feet June 9, 1928 (gage height, 15.80 feet); minimum discharge, that of Oct. 28, 1928; minimum gage height, 1.15 feet Aug. 14, 1926.

REMARKS.—Records good for discharges below 1,000 second-feet and fair for those above. Discharge estimated May 4.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
1	31	32	63	121	299	675	765	224
2	30	31	61	114	269	521	521	1,780
3	29	31	61	109	254	457	425	1,780
4	29	30	77	96	239	675	377	1,280
5	49	29	102	135	196	591	345	802
6	50	28	99	521	196	521	299	1,310
7	47	28	96	489	172	489	284	2,100
8	38	27	92	489	172	457	5,300	1,910
9	37	30	84	361	150	377	6,220	1,540
10	36	30	82	361	150	329	3,070	1,150
11	34	29	74	425	139	314	1,600	855
12	32	28	70	409	135	314	950	1,319
13	31	28	82	329	129	284	720	4,870
14	30	28	92	299	121	284	556	3,480
15	29	97	489	254	116	299	489	1,780
16	29	127	425	239	116	299	675	1,310
17	36	161	1,780	224	139	675	521	950
18	33	119	1,200	209	161	521	489	900
19	32	112	1,050	377	209	457	425	1,540
20	31	84	900	361	196	409	425	1,540
21	31	74	720	345	183	393	409	1,100
22	30	70	489	329	196	361	393	1,009
23	30	64	361	299	196	314	393	900
24	29	58	345	675	254	284	361	900
25	28	54	284	2,100	409	269	329	720
26	27	53	239	950	1,970	254	314	457
27	26	49	196	720	1,310	224	284	1,840
28	25	47	183	630	810	239	269	2,609
29	29	80	161	457	.....	254	269	1,159
30	28	68	150	377	.....	239	239	729
31	32	.....	139	329	.....	239	.....	729

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	50	25	32.5	0.106	0.12
November	161	27	57.5	.188	.21
December	1,780	61	331	1.08	1.24
January	2,100	96	424	1.39	1.60
February	1,970	116	317	1.04	1.08
March	675	224	388	1.27	1.46
April	6,220	239	924	3.02	3.37
May	4,870	224	1,440	4.71	5.43

Digitized by Google

JAMES RIVER BELOW BATTLEFIELD, MO.

LOCATION.—Chain gage in NE. ¼ sec. 32, T. 28 N., R. 22 W., at Blue Spring highway bridge, 3 miles southeast of Battlefield.

DRAINAGE AREA.—325 square miles.

RECORDS AVAILABLE.—May to September, 1929; February, 1926, to May, 1929, at site 3 miles upstream.

EXTREMES.—Maximum discharge during period May 13 to Sept. 30, 1929, 5,450 second-feet May 28 (gage height, 10.04 feet); minimum discharge, 34 second-feet Sept. 3; minimum gage height, 2.38 feet Sept. 29 and 30.

REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1929

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1	-------	515	168	75	35	16	1,500	405	91	64	67
2	-------	460	157	66	35	17	1,100	305	87	55	57
3	-------	405	144	77	34	18	1,170	260	83	53	53
4	-------	350	128	66	38	19	3,380	240	79	50	50
5	-------	305	130	62	44	20	1,600	240	75	45	48
6	-------	260	128	57	44	21	1,170	205	73	41	47
7	-------	305	133	55	44	22	925	240	71	39	45
8	-------	1,100	124	59	44	23	745	350	69	39	44
9	-------	776	117	93	42	24	625	305	68	39	42
10	-------	570	111	95	39	25	542	598	64	39	42
11	-------	460	154	91	38	26	432	350	62	38	41
12	-------	350	124	130	55	27	805	282	60	42	39
13	4,680	625	106	108	71	28	3,470	240	59	41	39
14	3,200	570	100	87	62	29	1,240	205	100	39	37
15	1,890	432	97	73	66	30	805	184	64	37	37
						31	625	-------	79	36	-------

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
May 13–31	4,680	432	1,580	4.86	3.43
June	1,100	184	396	1.22	1.36
July	168	59	100	.308	.36
August	130	36	61.0	.188	.22
September	71	34	45.8	.141	.16

Digitized by Google

JAMES RIVER AT GALENA, MO.

LOCATION.—Chain gage in NW. ¼ sec. 7, T. 24 N., R. 23 W., at bridge on State highway No. 44 at Galena, half a mile above Railey Creek. Zero of gage is 924.94 feet above mean sea level.

DRAINAGE AREA.—1,000 square miles.

RECORDS AVAILABLE.—October, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 16,800 second-feet Apr. 9 (gage height, 14.30 feet); minimum, 145 second-feet Sept. 28 (gage height, 1.61 feet).

1922–1929: Maximum discharge, 41,900 second-feet Apr. 15, 1927 (gage height, 25.15 feet); minimum, 52 second-feet Sept. 6, 7, 9, and 10, 1925 (gage height, 0.56 foot).

REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	236	219	565	538	1,110	2,040	900	1,110	1,720	620	330	212
2	236	229	512	512	970	1,960	1,180	2,480	1,640	620	330	209
3	236	229	462	486	900	1,720	1,180	5,240	1,640	620	330	209
4	236	222	486	486	835	1,560	1,110	3,700	1,480	592	330	209
5	272	222	486	486	802	1,560	1,040	2,750	1,400	565	310	254
6	310	216	486	512	770	1,640	970	2,750	1,180	538	291	272
7	272	212	486	1,180	739	1,560	900	4,730	1,260	592	291	236
8	254	209	462	1,480	648	1,480	1,640	4,980	2,840	538	291	236
9	236	202	462	1,330	592	1,330	15,600	8,120	2,840	512	330	233
10	236	202	438	1,330	592	1,180	8,280	4,730	2,130	486	372	229
11	229	202	416	1,400	512	1,110	4,850	3,600	1,720	512	620	229
12	222	202	372	1,330	462	1,110	3,500	6,520	1,560	486	462	236
13	216	196	394	1,260	512	1,040	2,840	11,600	3,920	462	438	310
14	212	205	620	1,110	512	970	2,480	7,800	2,220	462	372	291
15	216	272	678	1,040	486	1,040	2,300	5,640	2,220	416	350	272
16	219	350	835	1,040	462	1,640	2,220	4,140	1,720	416	330	254
17	236	394	2,840	900	438	2,300	1,960	3,400	1,480	416	310	254
18	229	416	5,240	802	416	1,960	1,800	3,110	1,330	394	291	229
19	222	438	3,110	835	416	1,720	1,720	6,840	1,180	372	272	222
20	222	394	2,300	1,040	620	1,640	2,570	5,240	1,040	372	272	222
21	222	350	1,960	1,110	678	1,330	3,400	3,600	970	350	272	236
22	222	330	1,640	1,040	708	1,260	2,660	2,930	970	350	254	229
23	216	310	1,330	1,040	678	1,180	2,220	2,390	1,040	350	254	189
24	216	291	1,110	1,330	708	1,040	2,040	2,040	1,040	350	254	164
25	209	254	1,040	4,730	835	970	1,960	1,880	970	330	236	150
26	202	236	900	3,810	4,250	900	1,720	1,800	970	330	236	148
27	209	229	770	2,840	4,030	802	1,560	2,130	900	330	236	153
28	219	222	708	2,130	2,750	770	1,400	3,700	770	310	229	162
29	219	272	648	1,640	-------	770	1,330	3,110	739	310	222	164
30	209	538	620	1,480	-------	770	1,180	2,390	678	330	219	164
31	202	-------	565	1,260	-------	802	-------	1,960	-------	330	216	------

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	310	202	229	0.229	0.26
November	538	196	275	.275	.31
December	5,240	372	1,060	1.06	1.22
January	4,730	486	1,340	1.34	1.54
February	4,250	416	980	.980	1.02
March	2,300	770	1,330	1.33	1.53
April	15,600	900	2,620	2.62	2.92
May	11,600	1,110	4,080	4.08	4.70
June	3,920	678	1,520	1.52	1.70
July	620	310	441	.441	.51
August	620	216	308	.308	.36
September	310	148	219	.219	.24
The year	15,600	145	1,200	1.20	16.31

Digitized by Google

BUFFALO RIVER NEAR RUSH, ARK.

LOCATION.—Staff gage in SE. ¼ sec. 10, T. 17 N., R. 15 W., immediately above Rush Creek, 1½ miles southeast of Rush.
DRAINAGE AREA.—1,110 square miles.
RECORDS AVAILABLE.—October, 1928, to September, 1929.
EXTREMES.—Maximum discharge during year, 56,600 second-feet Jan. 25 (gage height, 21.7 feet); minimum, 65 second-feet Sept. 25–30 (gage height, 0.6 foot).
REMARKS.—Records fair.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	460	415	1,340	605	1,430	3,070	4,860	890	1,700	1,030	370	130
2	460	505	1,100	555	1,180	2,940	2,810	10,400	1,340	1,800	415	95
3	460	555	960	555	1,030	2,810	2,110	4,220	1,900	2,810	370	95
4	505	530	655	605	960	2,220	2,110	3,620	5,030	1,700	370	95
5	555	505	605	710	960	2,110	1,900	2,810	2,570	1,430	460	95
6	555	505	555	5,200	890	2,220	1,520	2,940	2,000	1,260	555	130
7	505	460	555	2,690	960	2,570	1,180	2,000	1,700	5,560	460	130
8	505	460	505	2,110	960	2,330	7,540	6,700	1,900	18,200	415	95
9	460	438	505	1,520	890	2,110	26,500	18,800	1,900	3,770	415	95
10	460	370	505	2,110	770	1,900	15,500	8,760	1,340	2,450	370	95
11	460	370	505	1,900	655	1,610	6,900	4,540	1,180	2,110	370	95
12	415	415	460	1,520	710	1,340	4,070	1,700	1,030	2,220	370	95
13	415	415	890	1,340	770	1,180	3,620	3,340	1,610	1,900	370	130
14	460	415	4,860	1,180	830	1,610	5,560	4,700	3,070	1,700	325	95
15	460	460	2,690	1,100	830	2,000	11,700	5,030	2,000	1,340	325	95
16	580	555	2,110	1,080	770	2,110	4,860	2,570	1,700	1,030	285	95
17	655	555	2,110	960	770	2,220	2,810	1,700	1,610	710	285	98
18	555	555	3,770	1,080	890	1,900	4,070	1,340	1,340	580	205	95
19	415	460	2,570	1,180	1,030	1,800	10,400	1,340	1,260	460	205	89
20	415	415	1,800	1,030	1,180	1,610	4,860	1,260	1,100	415	205	80
21	460	415	1,340	890	1,100	1,430	20,400	1,180	1,030	370	165	80
22	460	460	1,260	890	1,260	1,430	7,540	1,030	890	325	165	80
23	460	370	1,180	830	1,340	1,430	3,620	890	6,900	285	130	80
24	460	370	1,030	11,200	1,610	1,520	2,330	830	4,540	245	130	71
25	415	370	770	42,000	6,700	1,520	2,330	770	3,340	245	130	65
26	415	370	580	9,280	24,200	1,260	2,110	1,260	2,330	245	130	65
27	370	325	630	4,700	6,900	1,100	1,800	3,920	1,900	245	130	65
28	370	580	1,260	2,220	4,220	960	1,520	8,000	1,260	245	130	65
29	415	1,030	1,030	2,000	-------	1,900	1,340	5,200	1,180	205	130	65
30	460	1,700	890	1,800	-------	1,340	1,180	3,070	1,030	305	130	65
31	415	-------	655	1,820	-------	1,100	-------	2,110	-------	370	130	-------

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	655	370	466	0.420	0.48	28,700
November	1,700	325	512	.461	.51	30,500
December	4,860	460	1,280	1.15	1.33	78,700
January	42,000	555	3,430	3.09	3.56	211,000
February	24,200	655	2,350	2.12	2.21	131,000
March	3,070	960	1,830	1.65	1.90	113,000
April	26,500	1,180	5,640	5.08	5.67	336,000
May	18,800	770	3,770	3.40	3.92	232,000
June	6,900	890	2,060	1.86	2.08	123,000
July	18,200	205	1,790	1.61	1.86	110,000
August	555	130	279	.251	.29	17,200
September	130	65	90.8	.082	.09	5,300
The year	42,000	65	1,950	1.76	23.90	1,420,000

Digitized by Google

NORTH FORK OF WHITE RIVER AT TECUMSEH, MO.

LOCATION.—Chain gage in sec. 16, T. 22 N., R. 12 W., at bridge on State highway No. 80 at Tecumseh, half a mile below Bryant Creek.

DRAINAGE AREA.—1,180 square miles.

RECORDS AVAILABLE.—October, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 12,200 second-feet Jan. 25 (gage height, 9.10 feet); minimum discharge, 570 second-feet Sept. 27–30; minimum gage height, 1.20 feet Sept. 30.

1922–1929: Maximum discharge, 53,000 second-feet June 13, 1928 (gage height, 24.00 feet); minimum, 363 second-feet Sept. 5, 1925.

Maximum stage known, 31.6 feet in July, 1905.

REMARKS.—Records good. Discharge estimated January 29.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	740	740	1,360	880	1,590	2,370	1,300	1,590	1,850	1,030	740	610
2	740	785	1,140	830	1,470	2,110	1,300	2,110	1,850	1,360	740	610
3	740	740	1,030	830	1,420	1,980	1,250	2,370	1,850	1,250	740	610
4	785	695	980	830	1,360	1,850	1,250	2,110	1,660	1,080	695	610
5	785	695	1,140	1,030	1,300	1,660	1,250	1,980	1,530	1,080	695	610
6	740	695	1,140	1,420	1,300	1,530	1,250	2,110	1,530	1,030	695	650
7	740	695	1,030	1,360	1,250	1,470	1,200	2,240	1,470	1,030	695	695
8	740	695	980	1,250	1,250	1,420	3,070	6,880	2,930	1,030	695	650
9	695	650	930	1,200	1,140	1,300	8,160	7,680	2,370	980	830	650
10	740	650	880	1,200	1,080	1,250	6,240	4,700	1,980	980	830	610
11	740	650	880	1,250	1,080	1,200	4,400	3,650	1,720	980	930	610
12	740	650	830	1,200	1,030	1,250	4,850	3,210	1,660	980	930	830
13	695	650	1,140	1,140	1,030	1,250	2,930	5,000	3,500	930	830	930
14	695	650	1,530	1,080	1,030	1,250	3,350	6,880	2,790	930	740	785
15	695	740	1,530	1,030	1,030	2,110	6,560	5,300	2,370	880	740	695
16	740	785	1,360	1,030	1,030	3,500	4,700	5,450	2,110	880	695	650
17	785	830	2,240	980	1,030	2,650	3,650	4,100	1,720	880	695	650
18	785	880	2,650	1,030	1,080	2,240	3,210	3,650	1,590	880	695	650
19	740	830	1,980	1,140	1,140	1,980	2,790	3,500	1,470	830	695	610
20	695	785	1,660	1,200	1,080	1,850	2,650	3,070	1,420	830	650	610
21	695	740	1,420	1,140	1,080	1,720	2,650	2,650	1,360	830	650	610
22	740	740	1,300	1,140	1,080	1,660	2,370	2,370	1,300	785	650	610
23	740	695	1,200	1,140	1,080	1,590	2,110	2,240	1,530	785	650	610
24	695	695	1,140	6,560	1,080	1,470	2,110	2,110	1,360	785	650	610
25	695	695	1,080	9,760	2,110	1,420	2,110	1,980	1,250	740	650	610
26	695	650	1,030	4,700	5,600	1,360	1,850	1,980	1,200	740	650	610
27	695	695	980	3,210	3,500	1,300	1,850	5,450	1,140	740	650	570
28	695	695	980	2,510	2,790	1,250	1,720	3,650	1,140	740	650	570
29	695	785	980	2,240	-------	1,300	1,660	2,650	1,080	830	610	570
30	695	1,850	930	1,980	-------	1,300	1,590	2,240	1,080	785	610	570
31	695	-------	880	1,720	-------	1,250	-------	1,980	-------	785	610	-------

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	785	695	725	0.614	0.71
November	1,850	650	758	.642	.72
December	2,650	830	1,240	1.05	1.21
January	9,760	830	1,870	1.58	1.82
February	5,600	1,030	1,500	1.27	1.32
March	3,500	1,200	1,670	1.42	1.64
April	8,160	1,200	2,850	2.42	2.70
May	7,680	1,590	3,450	2.92	3.37
June	3,500	1,080	1,730	1.47	1.64
July	1,360	740	914	.775	.89
August	930	610	709	.601	.69
September	930	570	642	.544	.61
The year	9,760	570	1,500	1.27	17.32

Digitized by Google

NORTH FORK OF WHITE RIVER NEAR HENDERSON, ARK.

LOCATION.—Staff gage in NE. ¼ SW. ¼ sec. 26, T. 20 N., R. 12 W., 1 mile from Henderson, 1 mile below Bennetts Bayou, and 19 miles above mouth.
DRAINAGE AREA.—1,640 square miles.
RECORDS AVAILABLE.—July, 1909, to December, 1910; October, 1928, to September, 1929.
EXTREMES.—Maximum discharge during year, 39,800 second-feet Jan. 24 (gage height, 17.0 feet); minimum, 639 second-feet Sept. 30 (gage height, 1.73 feet).
REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	865	910	1,900	1,150	2,380	3,760	2,260	2,140	2,770	1,250	910	695
2	865	955	1,900	1,100	2,140	3,180	2,020	2,260	2,380	1,560	910	695
3	865	910	1,200	1,100	2,020	2,900	1,900	2,900	2,260	1,670	865	695
4	865	910	1,900	1,100	1,780	2,640	1,780	2,770	2,140	1,560	820	695
5	955	910	1,450	1,250	1,670	2,380	1,780	2,510	2,140	1,560	820	655
6	955	910	1,250	1,900	1,670	2,140	1,670	3,460	2,020	1,450	820	695
7	955	865	1,250	1,900	1,670	2,020	1,670	3,040	1,900	1,450	820	775
8	955	865	1,250	1,780	1,560	1,900	12,300	14,500	6,000	1,350	775	820
9	910	865	1,200	1,670	1,560	1,780	13,900	13,400	3,610	1,350	910	775
10	910	865	1,150	1,780	1,450	1,670	10,300	7,480	2,900	1,450	1,150	735
11	910	820	1,100	1,670	1,450	1,670	7,040	5,420	2,510	1,560	1,050	735
12	910	820	1,100	1,670	1,450	1,560	5,060	4,550	2,140	1,450	1,450	910
13	865	820	1,670	1,560	1,350	1,560	4,070	6,000	2,020	1,350	1,250	1,250
14	865	820	2,260	1,450	1,350	1,670	6,400	8,390	4,390	1,350	1,000	1,050
15	865	865	2,140	1,350	1,350	3,430	10,300	7,260	3,040	1,250	910	955
16	910	1,000	2,020	1,350	1,350	4,890	7,930	7,260	2,380	1,200	820	820
17	955	1,050	3,760	1,250	1,350	3,910	5,610	6,200	2,260	1,200	820	735
18	1,000	1,200	2,900	1,450	1,350	3,040	4,720	5,420	2,020	1,150	775	695
19	865	1,150	2,380	1,450	1,450	2,900	4,070	4,890	1,900	1,100	775	695
20	955	1,100	2,140	1,450	1,450	2,640	3,610	4,390	1,780	1,050	775	695
21	955	1,050	1,900	1,560	1,450	2,380	3,760	3,910	1,670	1,050	775	695
22	955	955	1,780	1,560	1,450	2,260	3,610	3,460	1,670	1,000	735	695
23	955	955	1,780	1,450	1,560	2,140	3,320	3,180	1,560	955	735	695
24	910	955	1,560	25,500	1,560	2,020	3,180	2,900	1,560	955	735	655
25	910	955	1,450	18,800	9,380	1,780	2,900	2,640	1,560	910	735	655
26	865	865	1,350	7,480	9,330	1,670	2,640	2,380	1,450	910	735	655
27	865	865	1,350	5,060	5,610	1,670	2,380	2,770	1,450	865	735	655
28	865	865	1,250	3,910	4,390	1,670	2,380	6,660	1,450	865	735	655
29	865	955	1,250	3,180	------	1,560	2,260	6,200	1,350	865	735	655
30	865	2,380	1,150	2,770	------	1,560	2,140	3,910	1,350	865	735	655
31	865	------	1,150	2,640	------	1,560	------	3,180	------	865	695	------

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	1,000	865	906	0.552	0.64	55,700
November	2,380	820	980	.598	.67	58,300
December	3,760	1,100	1,670	1.02	1.18	103,000
January	25,500	1,100	3,330	2.03	2.34	205,000
February	9,380	1,350	2,380	1.45	1.51	132,000
March	4,890	1,560	2,320	1.41	1.63	143,000
April	13,900	1,670	4,570	2.79	3.11	272,000
May	14,500	2,140	5,010	3.05	3.52	308,000
June	6,000	1,350	2,250	1.37	1.53	134,000
July	1,670	865	1,210	.738	.85	74,400
August	1,450	695	855	.521	.60	52,600
September	1,250	655	748	.456	.51	44,500
The year	25,500	655	2,180	1.33	18.09	1,580,000

Digitized by Google

BLACK RIVER AT LEEPER, MO.

LOCATION.—Chain gage in SW. ¼ NE. ¼ sec. 27, T. 28 N., R. 3 E., at Missouri Southern Railway bridge at Leeper. Zero of gage is 423.97 feet above mean Gulf level.

DRAINAGE AREA.—957 square miles.

RECORDS AVAILABLE.—June, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 32,800 second-feet May 13 (gage height, 15.50 feet); minimum discharge, 347 second-feet Sept. 4; minimum gage height, 1.62 feet Oct. 1 and 12–14.

1921–1929: Maximum discharge, 37,000 second-feet Apr. 15, 1927 (gage height, 16.35 feet); minimum, 194 second-feet Sept. 9–11, 1925.

Maximum stage known, 21.3 feet in August, 1915.

REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	350	396	1,200	548	1,270	1,880	765	880	1,060	660	548	365
2	365	505	1,340	525	1,200	1,560	820	1,060	1,130	660	525	365
3	365	485	1,270	505	1,060	1,410	880	2,130	2,040	615	548	350
4	380	485	1,000	485	1,000	1,340	765	1,960	1,880	615	525	350
5	380	466	940	505	940	1,270	1,560	1,640	1,480	570	505	350
6	380	447	880	505	880	1,130	1,270	1,880	1,270	615	505	380
7	380	430	820	505	820	1,000	1,000	15,500	1,130	570	525	380
8	365	430	820	505	820	940	1,130	7,320	1,060	570	570	365
9	365	412	710	505	820	880	5,400	6,860	1,130	570	615	380
10	365	396	710	525	765	820	13,800	3,880	1,060	570	660	365
11	365	380	660	525	710	765	5,000	2,650	1,000	570	765	365
12	350	380	660	548	660	765	3,360	2,130	880	615	820	365
13	350	380	820	570	660	940	2,650	21,900	9,360	660	660	430
14	350	380	1,130	570	660	1,060	2,650	13,500	5,800	615	615	430
15	365	396	1,340	548	615	1,130	5,800	7,960	7,300	1,340	570	430
16	412	820	1,560	548	615	1,060	6,640	5,000	3,360	1,340	548	430
17	447	660	2,910	525	615	1,560	3,880	3,360	2,220	1,340	525	412
18	485	570	2,910	548	615	1,480	2,650	2,530	1,800	880	505	396
19	466	525	2,130	765	615	1,410	2,130	2,220	1,560	765	485	380
20	447	505	1,640	820	615	1,270	1,880	2,040	1,340	710	485	365
21	447	525	1,410	765	615	1,130	1,720	1,800	1,200	660	466	380
22	412	505	1,200	765	570	1,060	1,560	1,560	1,060	615	447	365
23	396	505	1,060	940	570	940	1,410	1,480	1,000	615	430	365
24	380	505	880	1,880	570	880	1,340	1,410	940	615	430	365
25	380	485	820	15,700	1,130	820	1,340	1,270	880	570	430	365
26	380	485	820	5,000	2,530	765	1,200	1,200	820	570	412	365
27	380	447	820	2,780	3,360	765	1,130	1,200	765	548	412	350
28	380	447	765	2,130	2,220	765	1,060	1,200	765	548	412	350
29	380	485	660	1,880	-------	710	940	1,130	710	548	412	350
30	380	1,200	615	1,560	-------	710	940	1,060	710	525	396	350
31	380	-------	570	1,410	-------	710	-------	1,000	-------	525	396	-------

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	485	350	388	0.406	0.47
November	1,200	380	501	.524	.58
December	2,910	570	1,130	1.18	1.36
January	15,700	485	1,480	1.55	1.79
February	3,360	570	983	1.03	1.07
March	1,880	710	1,060	1.11	1.28
April	13,800	765	2,560	2.68	2.99
May	21,900	880	3,890	4.06	4.68
June	9,360	710	1,890	1.97	2.20
July	1,340	525	684	.715	.82
August	820	396	521	.544	.63
September	430	350	375	.392	.44
The year	21,900	350	1,290	1.35	18.31

Digitized by Google

BLACK RIVER AT BLACK ROCK, ARK.

LOCATION.—Staff gage in sec. 21, T. 12 N., R. 1 W., at Black Rock.
DRAINAGE AREA.—7,400 square miles.
RECORDS AVAILABLE.—June 1 to Sept. 30, 1929.
EXTREMES.—Maximum discharge, 18,200 second-feet June 1 (gage height, 15.0 feet); minimum, 3,410 second-feet Sept. 28–30 (gage height, 2.7 feet).
REMARKS.—Records fair. Gage-height record furnished by United States Weather Bureau.

Daily and monthly discharge, in second-feet, 1929

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.
1	18,200	8,520	5,850	3,970	16	13,800	5,940	6,750	4,230
2	15,600	8,080	5,940	3,970	17	15,000	5,940	6,300	4,140
3	14,200	7,860	5,580	3,810	18	14,600	6,120	5,850	4,050
4	12,600	7,650	5,220	3,650	19	14,200	5,940	5,400	3,890
5	10,900	7,250	4,950	3,650	20	13,200	5,940	5,130	3,810
6	10,000	6,950	4,770	4,500	21	11,400	5,940	4,950	3,810
7	9,640	6,750	4,500	4,140	22	10,100	5,850	4,770	3,730
8	9,880	6,660	4,320	4,050	23	9,880	5,760	4,680	3,650
9	11,400	6,480	4,320	4,050	24	9,760	5,760	4,500	3,570
10	10,400	6,300	4,230	3,890	25	11,400	5,580	4,320	3,570
11	9,400	6,210	4,950	3,810	26	10,700	5,400	4,230	3,490
12	8,740	6,210	8,300	3,730	27	10,400	5,400	4,230	3,490
13	8,740	6,120	9,070	3,890	28	10,000	5,310	4,230	3,410
14	10,600	6,120	8,300	4,320	29	9,400	5,220	4,140	3,410
15	12,300	6,120	7,750	4,320	30	8,960	5,130	4,050	3,410
					31		5,130	4,050	

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
June	18,200	8,740	11,500	1.55	1.73	684,000
July	8,520	5,130	6,250	.84	.97	384,000
August	9,070	4,050	5,340	.72	.83	328,000
September	4,500	3,410	3,850	.52	.58	229,000
The period						1,620,000

Digitized by Google

CURRENT RIVER AT VAN BUREN, MO.

LOCATION.—Chain gage in NE. ¼ NW. ¼ sec. 25, T. 27 N., R. 1 W., at bridge on State highway No. 60 in Van Buren. Zero of gage is 445.79 feet above mean sea level.

DRAINAGE AREA.—1,640 square miles.

RECORDS AVAILABLE.—June, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 23,100 second-feet May 13 (gage height, 10.48 feet); minimum discharge, 1,030 second-feet Sept. 3 and 28–30; minimum gage height, 2.00 feet Sept. 29 and 30.

1921–1929: Maximum discharge, 49,300 second-feet June 10, 1928 (gage height, 16.45 feet); minimum, 542 second-feet Sept. 6, 8, 9, and 12, 1925.

Maximum stage known, 26.0 feet Mar. 26, 1904.

REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,270	1,320	3,070	1,270	2,470	3,680	1,910	2,180	2,320	1,660	1,320	1,080
2	1,270	1,380	2,320	1,220	2,470	3,220	1,910	2,620	2,320	1,660	1,430	1,080
3	1,320	1,380	1,910	1,270	2,320	2,920	2,040	3,220	2,320	1,660	1,380	1,080
4	1,380	1,320	1,780	1,270	2,180	2,620	2,180	3,520	2,180	1,660	1,320	1,080
5	1,320	1,320	1,660	1,320	2,180	2,470	2,040	3,220	2,180	1,540	1,320	1,120
6	1,270	1,320	1,660	1,320	2,040	2,470	1,910	4,660	2,180	1,540	1,320	1,220
7	1,270	1,220	1,660	1,380	2,040	2,320	1,910	15,900	2,180	1,540	1,270	1,220
8	1,220	1,220	1,660	1,540	1,910	2,180	2,620	8,600	2,180	1,540	1,780	1,170
9	1,270	1,170	1,660	1,660	1,780	2,040	7,560	11,600	2,040	1,540	2,040	1,120
10	1,220	1,220	1,660	1,660	1,780	1,910	12,800	8,320	2,040	1,540	2,040	1,120
11	1,220	1,170	1,540	1,660	1,660	1,910	8,900	6,160	1,910	1,540	3,070	1,120
12	1,170	1,170	1,540	1,660	1,660	1,910	6,380	7,080	1,780	1,660	3,520	1,270
13	1,220	1,170	1,780	1,540	1,660	1,910	5,060	18,400	10,400	1,660	2,320	1,380
14	1,270	1,220	1,910	1,430	1,540	1,910	4,480	19,200	8,900	1,430	1,780	1,320
15	1,270	1,220	1,910	1,380	1,540	2,320	7,560	15,500	6,840	1,910	1,660	1,220
16	1,320	1,320	2,180	1,430	1,540	3,840	9,500	8,320	5,500	2,470	1,540	1,170
17	1,380	1,430	2,920	1,660	1,540	4,160	6,380	6,380	3,840	2,040	1,430	1,120
18	1,380	1,540	3,070	2,040	1,540	3,370	5,060	5,500	3,220	1,910	1,380	1,120
19	1,320	1,540	2,770	1,910	1,660	2,920	4,320	4,860	2,920	1,660	1,380	1,120
20	1,270	1,430	2,470	1,910	1,660	2,620	4,000	4,480	2,620	1,540	1,320	1,120
21	1,270	1,380	2,180	1,910	1,660	2,620	3,680	4,000	2,470	1,540	1,320	1,120
22	1,270	1,320	1,910	1,780	1,540	2,470	3,370	3,680	2,320	1,430	1,270	1,120
23	1,220	1,320	1,660	1,780	1,540	2,320	3,070	3,520	2,180	1,430	1,270	1,080
24	1,270	1,270	1,660	3,070	1,540	2,180	2,920	3,220	2,180	1,380	1,220	1,080
25	1,170	1,220	1,660	12,800	2,470	2,040	2,770	3,070	2,040	1,380	1,220	1,080
26	1,170	1,220	1,540	9,200	7,080	2,040	2,770	3,070	1,910	1,320	1,170	1,080
27	1,320	1,220	1,430	5,280	6,160	1,910	2,470	3,070	1,910	1,320	1,220	1,080
28	1,270	1,220	1,380	4,160	4,320	1,910	2,470	2,920	1,910	1,320	1,170	1,080
29	1,220	1,430	1,320	3,370	-------	1,910	2,320	2,770	1,660	1,380	1,170	1,080
30	1,220	1,430	1,320	3,070	-------	1,910	2,180	2,620	1,660	1,380	1,120	1,030
31	1,170	-------	1,320	2,770	-------	1,780	---------	2,470	---------	1,380	1,120	------

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	1,380	1,170	1,260	0.768	0.89
November	1,540	1,170	1,300	.793	.88
December	3,070	1,320	1,890	1.15	1.33
January	12,800	1,220	2,570	1.57	1.81
February	7,080	1,540	2,270	1.38	1.44
March	4,160	1,780	2,440	1.49	1.72
April	12,800	1,910	4,220	2.57	2.87
May	19,200	2,180	6,260	3.82	4.40
June	10,400	1,660	3,000	1.83	2.04
July	2,470	1,320	1,580	.963	1.11
August	3,520	1,120	1,540	.939	1.08
September	1,380	1,030	1,130	.689	.77
The year	19,200	1,030	2,460	1.50	20.34

Digitized by Google

CURRENT RIVER AT DONIPHAN, MO.

LOCATION.—Chain gage in N. ½ sec. 27, T. 23 N., R. 2 E., at bridge on State highway No. 42, three-fourths of a mile west of Doniphan. Zero of gage is 323.30 feet above mean sea level.

DRAINAGE AREA.—2,030 square miles.

RECORDS AVAILABLE.—June, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 27,800 second-feet May 14 (gage height, 12.40 feet); minimum, 1,620 second-feet several days during October, November, August, and September; minimum gage height, 0.44 foot Sept. 30.

1921–1929: Maximum discharge, 48,800 second-feet Apr. 15, 1927 (gage height, 17.30 feet); minimum, 1,020 second-feet Aug. 27 to Sept. 14, 1925.

Maximum stage known, 25.5 feet in August, 1915.

REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,810	1,810	4,940	2,030	3,730	5,760	2,510	3,030	3,590	2,260	1,710	1,810
2	1,710	2,640	3,870	1,920	3,450	4,780	2,640	3,730	3,590	2,260	1,810	1,810
3	1,810	2,260	3,170	1,920	3,310	4,320	4,620	4,320	3,590	2,260	1,710	1,710
4	1,810	2,140	2,900	1,920	3,030	4,780	5,100	4,780	3,310	2,260	1,620	1,810
5	1,810	2,030	2,900	1,920	2,900	4,170	3,870	4,470	3,310	2,140	1,620	1,810
6	1,810	1,920	2,900	2,030	2,770	3,730	3,450	4,620	3,170	2,260	1,620	1,920
7	1,810	1,920	2,770	2,140	2,770	3,450	3,170	9,720	3,170	2,260	1,710	1,920
8	1,710	1,810	2,640	2,260	2,640	3,310	3,590	17,100	3,170	2,140	2,140	1,920
9	1,710	1,810	2,380	2,140	2,510	3,030	8,300	12,400	3,170	2,140	2,510	1,810
10	1,710	1,710	2,380	2,140	2,510	2,900	13,500	14,000	2,900	2,640	2,900	1,710
11	1,710	1,710	2,260	2,260	2,380	2,770	15,000	9,100	2,770	2,030	3,730	1,710
12	1,710	1,710	2,140	2,380	2,260	2,510	9,940	7,380	2,770	2,260	4,470	2,030
13	1,710	1,710	2,640	2,260	2,260	2,900	7,560	10,600	4,320	2,140	4,020	2,140
14	1,710	1,620	3,030	2,260	2,260	3,030	5,260	23,700	14,700	2,030	3,030	2,140
15	1,710	1,710	3,170	2,140	2,140	3,030	7,740	23,000	8,700	2,260	2,510	2,030
16	3,030	2,030	3,730	2,030	2,140	3,170	10,400	17,300	8,300	3,730	2,260	1,920
17	2,380	2,140	5,260	2,030	2,140	5,940	9,940	9,940	6,120	3,030	2,140	1,920
18	2,260	2,380	5,760	3,310	2,140	4,780	7,560	8,100	4,780	2,510	2,030	1,810
19	2,030	2,510	5,260	3,170	2,140	4,170	6,300	7,560	4,170	2,260	2,030	1,810
20	1,920	2,380	4,470	3,170	2,140	3,730	5,760	6,840	3,730	2,140	1,920	1,710
21	1,810	2,140	3,870	3,030	2,140	3,450	5,420	6,120	3,450	2,030	1,920	1,710
22	1,920	2,030	3,450	3,030	2,030	3,310	4,940	5,580	3,170	1,920	1,920	1,710
23	1,810	2,030	3,170	2,900	2,030	3,170	4,470	5,260	3,030	1,920	1,920	1,710
24	1,810	1,920	2,900	7,920	2,030	2,900	4,170	4,780	2,900	1,810	1,810	1,620
25	1,710	1,810	2,770	14,500	3,450	2,770	4,020	4,620	2,770	1,810	1,810	1,620
26	1,710	1,810	2,640	17,100	8,700	2,640	3,870	4,470	2,770	1,710	1,810	1,620
27	1,710	1,810	2,510	9,300	9,720	2,510	3,590	4,620	2,640	1,710	1,810	1,710
28	1,810	1,810	2,380	6,840	7,560	2,510	3,450	4,470	2,510	1,710	1,710	1,620
29	1,810	2,140	2,260	5,420	------	2,380	3,310	4,170	2,510	1,710	1,810	1,620
30	1,710	3,310	2,140	4,620	------	2,380	3,030	4,020	2,380	1,710	1,810	1,620
31	1,620	------	2,030	4,170	------	2,260	--------	3,730	--------	1,710	1,710	------

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	3,030	1,620	1,850	0.911	1.05
November	3,310	1,620	2,030	1.00	1.12
December	5,760	2,030	3,180	1.57	1.81
January	17,100	1,920	4,010	1.98	2.28
February	9,720	2,030	3,190	1.57	1.64
March	5,940	2,260	3,440	1.69	1.95
April	15,000	2,510	5,880	2.90	3.24
May	23,700	3,030	8,180	4.03	4.65
June	14,700	2,380	4,050	2.00	2.23
July	3,730	1,710	2,150	1.06	1.22
August	4,470	1,620	2,180	1.07	1.23
September	2,140	1,620	1,800	.887	.99
The year	23,700	1,620	3,500	1.72	23.41

Digitized by Google

BIG SPRING NEAR VAN BUREN, MO.

LOCATION.—Vertical staff gage in sec. 6, T. 26 N., R. 1 E., 600 feet above mouth of Spring Branch and 4 miles southeast of Van Buren. Zero of gage is 429.8 feet above mean sea level.

RECORDS AVAILABLE.—January to June, 1922, and April, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, estimated at 900 second-feet during backwater from Current River in May; minimum, 382 second-feet Nov. 12 and 13 (gage height, 0.54 foot).

1922–1929: Maximum discharge, estimated at 1,100 second-feet during backwater in June, 1928; minimum, 268 second-feet Sept. 17–24, 1926.

REMARKS.—Records poor; fragmentary on account of missing gage readings or backwater from Current River.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	457	410	*600	410			618	*567	505	441	420
2	457	405	*550	405			*646	*550	505	446	420
3	462	*403	495	400			*602	*550	505	441	420
4	457	*400	459	394	*656		*546	*560	498	431	420
5	457	*398	476	*403	*677			*553	492	431	420
6	452	*396	482	*411	*688			*563	492	426	420
7	*449	*394	459	420	656			*563	492	431	420
8	446	*391	449	415	618			*570	492	498	420
9	446	*389	*436	420	570			*570	479	530	415
10	441	*387	423	431	*560			586	473	550	410
11	433	*384	405	431	550			570	468	*706	410
12	*430	382	431	431	543			563	492	*761	410
13	428	382	436	*436	556			*750	486	*682	436
14	*430	*390	492	420	570			*750	473	594	431
15	433	397	530	410	586			*700	486	537	426
16	*446	413	*554	*423	*634			*761	*656	511	415
17	459	415	*578	436	*600			*730	537	492	415
18	449	*428	*688	492	*553			*543	505	479	410
19	439	441	*661		*586			*518	479	468	410
20	433	420	*646		*594			*527	468	462	405
21	*427	410	610		*592			*537	457	457	405
22	*421	405	524		*590			*563	457	452	405
23	415	*400	*502		*586			*556	452	446	405
24	415	394	479					*563	452	446	405
25	*415	*392	*468					563	446	441	405
26	415	389	457					556	441	441	405
27	*413	389	436					543	441	436	405
28	*412	384	400				*725	530	441	431	400
29	410	*500	*403			656	*631	524	436	426	400
30	410	*550	*407			636	*537	518	441	426	400
31	410		410				*546		441	426	

Month	Discharge in second-feet			Month	Discharge in second-feet		
	Maximum	Minimum	Mean		Maximum	Minimum	Mean
October	462	410	434	June	761	518	583
November	550	382	408	July	656	436	480
December	688	400	495	August	761	426	489
January 1–18	492	394	422	September	436	400	413
March 4–23	688	543	598				

* Estimated.

Digitized by Google

ELEVEN POINT RIVER NEAR BARDLEY, MO.

LOCATION.—Chain gage in NW. ¼ sec. 20, T. 23 N., R. 2 W., at bridge on State highway No. 42, 7 miles southwest of Bardley.

RECORDS AVAILABLE.—October, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 8,000 second-feet Jan. 25 (gage height, 9.55 feet); minimum discharge, 562 second-feet Nov. 11–15, 27, 28, and Sept. 29, 30; minimum gage height, 2.48 feet Sept. 29, 30.

1922–1929: Maximum discharge, 27,800 second-feet Apr. 14, 1927 (gage height, 18.74 feet); minimum, 210 second-feet Sept. 6–11, 1925 (gage height, 1.06 feet).

Maximum stage known, 19.7 feet in August, 1915.

REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	675	590	802	705	1,340	1,730	1,120	1,260	1,340	900	835	618
2	675	738	738	705	1,260	1,650	1,120	1,570	1,340	970	770	618
3	705	675	738	675	1,260	1,650	1,340	1,490	1,260	970	770	618
4	645	645	835	675	1,190	1,570	1,490	1,420	1,190	900	738	618
5	675	618	1,570	675	1,190	1,490	1,340	1,340	1,190	900	738	835
6	645	618	802	675	1,190	1,420	1,260	1,490	1,190	970	738	675
7	645	618	770	675	1,120	1,340	1,260	1,420	1,190	900	738	645
8	645	590	738	645	1,120	1,260	2,070	1,890	1,260	900	770	645
9	645	590	705	645	1,040	1,260	4,720	3,160	1,190	900	802	618
10	645	590	705	738	970	1,190	3,660	2,360	1,190	900	770	618
11	645	562	675	770	970	1,120	2,760	2,070	1,120	900	900	618
12	645	562	675	738	970	1,120	2,260	1,890	1,120	835	900	900
13	645	562	675	705	970	1,190	1,980	1,980	1,260	835	835	835
14	618	562	835	705	970	1,190	2,070	2,760	1,260	835	835	705
15	618	562	835	675	900	1,190	3,160	2,260	1,340	835	802	675
16	900	645	835	705	900	1,260	2,960	2,160	1,340	835	770	645
17	675	705	1,190	705	900	1,260	2,460	1,890	1,260	900	770	645
18	645	705	1,260	770	900	1,190	2,160	1,810	1,190	835	738	618
19	645	738	1,120	1,040	900	1,190	1,980	2,070	1,120	835	738	618
20	618	645	1,040	970	900	1,190	1,890	1,730	1,120	802	738	618
21	618	645	970	970	900	1,120	1,810	1,650	1,040	802	705	590
22	645	618	900	900	900	1,120	1,730	1,570	1,040	802	705	590
23	618	618	900	900	900	1,120	1,570	1,490	1,040	802	705	590
24	618	590	835	3,760	900	1,120	1,570	1,420	1,040	802	705	590
25	618	590	835	7,000	1,810	1,040	1,570	1,490	970	770	705	590
26	590	590	802	3,260	4,240	1,040	1,490	1,490	970	770	705	590
27	618	562	770	2,360	2,660	970	1,420	1,420	970	770	675	590
28	590	562	770	1,980	2,070	970	1,420	1,490	970	770	675	590
29	590	645	738	1,730	-------	970	1,340	1,420	970	770	675	562
30	590	802	738	1,570	-------	970	1,340	1,340	900	802	675	562
31	590	-------	705	1,490	-------	970	-------	1,260	-------	835	645	------

Month	Maximum	Minimum	Mean
October	900	590	643
November	802	562	625
December	1,570	675	855
January	7,000	645	1,310
February	4,240	900	1,260
March	1,730	970	1,220
April	4,720	1,120	1,940
May	3,160	1,260	1,740
June	1,340	900	1,180
July	970	770	850
August	900	645	750
September	900	562	641
The year	7,000	562	1,080

Digitized by Google

GREER SPRING AT GREER, MO.

LOCATION.—Vertical staff gage in SE. ¼ SW. ¼ sec. 36, T. 25 N., R. 4 W., 500 feet below lower outlet of the spring and 1 mile north of Greer. Zero of gage is 539.0 feet above mean sea level.

RECORDS AVAILABLE.—August to December, 1904; November, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 826 second-feet May 30 to June 1 (gage height, 1.22 feet); minimum, 317 second-feet Sept. 28–30 (gage height, 0.75 foot).

1922–1929: Maximum discharge, 903 second-feet May 26, 1927 (gage height, 1.43 feet); minimum discharge, 151 second-feet Aug. 19, 1925.

REMARKS.—Records fair. Gage read three times a week; discharge estimated for remaining days.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	457	457	382	366	382	432	497	723	826	477	417	366
2	450	467	386	366	390	437	490	728	812	484	417	366
3	444	477	390	366	394	437	484	728	798	490	417	361
4	437	482	393	374	399	437	477	728	789	497	417	355
5	437	487	396	382	405	444	477	721	779	497	417	350
6	437	484	399	382	411	450	477	714	770	497	424	343
7	437	480	408	382	417	457	482	723	749	497	430	336
8	437	477	417	385	427	457	487	733	728	497	437	336
9	430	467	417	387	437	457	497	742	707	490	437	336
10	424	457	417	390	437	447	507	770	686	484	437	341
11	417	447	417	378	437	437	518	798	677	477	437	345
12	412	437	417	366	444	430	529	798	669	467	437	350
13	408	427	417	382	450	424	540	798	660	457	417	358
14	412	417	427	384	457	417	570	789	648	437	437	366
15	417	408	437	386	457	417	600	779	636	417	457	358
16	411	399	427	388	457	417	612	770	636	408	447	350
17	405	390	417	390	447	427	624	784	636	399	437	345
18	399	378	411	390	437	437	636	798	644	390	427	341
19	399	366	405	390	430	444	661	798	652	378	417	336
20	399	361	399	390	424	450	686	798	660	366	405	336
21	418	356	417	390	417	457	728	779	673	366	394	336
22	437	350	390	387	408	467	770	761	686	366	382	336
23	444	350	386	385	399	477	779	742	661	371	382	336
24	450	350	382	382	408	477	789	756	636	377	382	332
25	457	358	377	374	417	477	798	770	620	382	382	327
26	447	366	371	366	420	477	784	784	604	390	382	323
27	437	361	366	366	424	477	770	798	588	399	377	320
28	447	355	366	366	427	477	742	807	553	399	371	317
29	457	350	366	369	-------	487	714	817	518	399	366	317
30	457	366	366	371	-------	497	719	826	498	405	366	317
31	457	-------	366	374	-------	497	-------	826	-------	411	366	-------

Month	Discharge in second-feet			Month	Discharge in second-feet		
	Maximum	Minimum	Mean		Maximum	Minimum	Mean
October	457	399	432	May	826	714	771
November	487	350	411	June	826	498	673
December	437	366	398	July	497	366	431
January	390	366	379	August	457	366	410
February	457	382	424	September	366	317	341
March	497	417	452				
April	789	477	615	The year	826	317	478

Digitized by Google

LITTLE RED RIVER NEAR HEBER SPRINGS, ARK.

LOCATION.—Staff gage in NE. ¼ sec. 1, T. 10 N., R. 10 W., 4 miles northeast of Heber Springs.

DRAINAGE AREA.—1,160 square miles.

RECORDS AVAILABLE.—September, 1927, to September, 1929.

EXTREMES.—Maximum discharge during year, 41,100 second-feet Feb. 26 (gage height, 29.10 feet); minimum, 1.5 second-feet Sept. 27–30 (gage height, 2.45 feet).

1928–29: Maximum discharge, 88,800 second-feet Apr. 6, 1928 (gage height, 42.35 feet); minimum, 1.5 second-feet Sept. 27–30, 1929 (gage height, 2.45 feet).

REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	21	1,070	7,700	660	2,040	5,100	4,550	2,110	2,250	230	38	5
2	22	1,120	3,830	620	1,730	5,100	6,870	7,420	1,970	220	33	4
3	21	1,370	2,670	520	1,490	3,460	4,440	6,610	1,850	190	49	4
4	22	1,120	1,970	520	1,370	7,560	3,830	4,660	7,420	230	58	5
5	23	580	1,850	550	1,220	6,870	3,120	3,460	3,730	370	49	7
6	21	460	1,120	3,830	1,170	4,660	2,670	2,600	2,390	290	39	8
7	20	370	870	3,460	1,170	3,730	2,180	3,040	1,970	220	43	8
8	18	315	1,120	2,600	1,070	2,880	1,970	2,320	3,730	200	37	8
9	18	265	1,070	2,040	1,070	2,390	31,800	38,000	3,280	190	33	7
10	18	230	780	4,660	1,020	2,040	21,000	7,140	2,810	660	27	6
11	18	210	740	4,440	1,020	1,670	8,850	4,440	1,910	430	24	6
12	14	190	700	3,460	920	1,550	5,830	3,280	1,370	520	24	4
13	14	170	4,660	2,670	820	1,790	3,830	3,280	1,170	385	53	4
14	9	160	15,300	2,320	870	2,960	3,280	13,700	1,120	278	43	4
15	10	160	6,870	1,970	970	2,740	5,580	8,400	1,170	220	33	3
16	18	154	4,440	1,910	1,070	4,330	4,660	5,340	1,120	190	29	3
17	22	170	13,200	1,790	1,120	3,640	3,640	3,550	700	180	24	4
18	24	740	16,100	1,850	1,170	2,810	2,960	2,670	580	150	31	3
19	265	1,370	7,420	8,700	1,370	2,390	5,960	2,250	490	128	29	3
20	328	1,070	7,140	5,700	1,610	2,110	4,550	1,910	430	106	24	3
21	302	780	3,460	4,030	1,550	2,110	13,700	1,550	430	87	19	2
22	170	620	2,670	3,370	1,490	2,250	11,900	1,220	355	78	14	2
23	138	580	2,180	2,740	1,610	2,110	5,830	1,070	385	70	13	2
24	116	460	1,850	4,130	2,040	1,850	3,930	490	355	61	12	2
25	100	400	1,550	3,040	2,810	1,610	4,330	740	2,040	59	12	2
26	82	340	1,320	4,770	40,800	1,430	3,930	970	820	51	9	2
27	78	315	1,170	7,140	22,100	1,910	2,880	1,070	550	45	9	2
28	74	290	1,070	4,880	6,870	7,000	2,530	1,370	460	41	9	2
29	73	278	1,070	3,640	.....	5,460	2,530	2,390	430	39	8	2
30	72	7,980	820	3,040	.....	7,420	2,180	2,880	265	108	8	2
31	68	.....	660	2,390	.....	4,880	.....	3,550	.....	47	6	.....

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	328	9	70.9	0.061	0.07	4,360
November	7,980	154	778	.671	.75	46,300
December	16,100	660	3,790	3.27	3.77	233,000
January	8,700	520	3,140	2.71	3.12	193,000
February	40,800	820	3,700	3.19	3.32	205,000
March	7,560	1,430	3,480	3.00	3.46	214,000
April	31,800	1,970	6,180	5.33	5.95	368,000
May	38,000	490	4,630	3.99	4.60	285,000
June	7,420	265	1,580	1.36	1.52	94,000
July	660	39	196	.169	.19	12,100
August	58	6	27.1	.023	.03	1,670
September	8	2	4.0	.0034	.004	238
The year	40,800	2	2,290	1.97	26.78	1,660,000

Digitized by Google

CACHE RIVER AT PATTERSON, ARK.

LOCATION.—Staff gage in sec. 6, T. 7 N., R. 2 W., at Patterson. Zero of gage is 188.27 feet above mean sea level.

DRAINAGE AREA.—790 square miles.

RECORDS AVAILABLE.—February, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 6,340 second-feet May 16 (gage height, 10.3 feet); minimum, 100 second-feet Sept. 30 (gage height, 3.0 feet).

1928–29: Maximum discharge, 12,100 second-feet June 27 and 28, 1928 (gage height, 11.8 feet); minimum, 100 second-feet Sept. 30, 1929 (gage height, 3.0 feet).

Maximum stage known, 17.1 feet April, 1927, owing to White River levee break.

REMARKS.—Records fair. Gage-height record furnished by United States Weather Bureau.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	124	1,900	258	2,060	4,530	2,400	1,590	1,110	800	258	221	128
2	120	1,110	258	1,740	4,530	2,950	1,450	1,110	840	258	161	128
3	120	880	243	1,450	4,260	2,950	1,740	1,200	840	258	147	124
4	120	760	243	1,040	4,010	4,010	2,060	1,450	800	273	168	124
5	120	680	243	760	4,010	5,100	2,400	1,320	680	273	168	124
6	116	680	258	645	4,010	5,700	2,400	1,200	610	273	161	124
7	116	680	313	540	4,010	5,700	2,400	1,110	610	273	168	124
8	112	840	475	475	4,010	5,400	2,230	1,040	645	273	168	124
9	112	1,040	680	415	4,010	5,100	2,230	2,400	680	258	168	120
10	112	1,450	980	415	4,010	4,530	2,400	3,560	680	258	175	116
11	112	1,740	1,590	505	3,350	4,260	2,580	4,010	800	258	175	116
12	112	1,740	1,900	575	2,580	4,260	2,760	4,530	800	258	168	112
13	112	1,320	1,900	680	1,900	4,530	2,950	4,530	800	258	140	108
14	112	1,040	1,450	720	1,110	4,530	2,950	5,100	680	258	140	104
15	132	980	1,220	800	880	4,530	3,780	6,020	645	243	161	104
16	154	720	980	930	840	4,400	4,010	6,340	610	336	221	128
17	182	540	980	930	800	4,260	4,010	5,700	575	273	359	140
18	203	445	1,320	1,320	760	3,560	3,780	5,100	540	313	540	140
19	210	385	2,060	1,450	720	2,760	3,560	4,530	505	336	720	136
20	210	313	2,950	1,450	645	2,230	3,350	4,010	540	336	720	124
21	210	273	3,560	1,320	575	1,740	3,150	3,780	610	313	610	119
22	258	258	4,010	1,110	540	1,900	3,350	3,350	680	313	475	113
23	720	232	4,260	980	505	1,900	3,560	2,760	720	336	359	108
24	1,590	210	4,260	760	645	1,740	3,350	2,230	610	336	273	108
25	2,060	203	4,260	1,590	800	1,450	3,150	2,060	645	336	232	108
26	2,230	196	3,780	2,580	980	1,200	2,580	2,060	540	336	196	104
27	2,400	196	3,150	3,150	1,450	1,040	2,400	1,900	475	336	175	104
28	2,400	210	3,150	3,560	2,230	1,040	2,230	1,320	445	336	154	104
29	2,400	243	2,950	3,780	-------	1,320	1,590	1,040	385	273	140	104
30	2,400	258	2,950	4,010	-------	1,590	1,320	880	336	243	136	100
31	2,580	-------	2,400	4,260	-------	1,590	-------	800	-------	232	132	-------

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	2,580	112	708	0.896	1.03	43,500
November	1,900	196	717	.908	1.01	42,700
December	4,260	243	1,900	2.40	2.77	117,000
January	4,260	415	1,480	1.87	2.16	91,000
February	4,530	505	2,240	2.84	2.96	124,000
March	5,700	1,040	3,220	4.08	4.70	198,000
April	4,010	1,320	2,710	3.43	3.83	161,000
May	6,340	800	2,820	3.57	4.12	173,000
June	840	336	628	.795	.89	37,400
July	336	232	288	.365	.42	17,700
August	720	132	256	.324	.37	15,700
September	140	100	117	.148	.17	6,960
The year	6,340	100	1,420	1.80	24.43	1,030,000

Digitized by Google

ARKANSAS RIVER BASIN

ARKANSAS RIVER AT SYRACUSE, KANS.

LOCATION.—Water-stage recorder in NW. ¼ sec. 18, T. 24 S., R. 40 W., at highway bridge half a mile south of Syracuse.

DRAINAGE AREA.—25,000 square miles.

RECORDS AVAILABLE.—August, 1902, to November, 1905; April to July, 1906; June, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 37,000 second-feet Aug. 8 (gage height, 6.04 feet); minimum, probably less than 3 second-feet.

1902-1906, 1921-1929: Maximum stage about 9.75 feet on June 6, 1921 (discharge not known; the value of 45,000 second-feet published in previous reports is much too small); minimum discharge, 2 second-feet in August, 1926. Bank-full stage, 5.0 feet.

REMARKS.—Records fair October and March to June; poor for remainder of year. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6	------	*420	460	------		97	30	44	b15		
2	6	------	422	429	------		97	50	44	b12	*3	
3	6	------		398	------		92	63	44	b10		
4	6	172	*425	429	------	*750	89	66	46	b10	1,720	
5	6	------		422	------		86	66	46	b15	3,270	*86
6	6	------	429	*320	------		75	66	48	b30	2,700	
7	6	------	370	*318	------	295	70	59	59	b35	1,990	
8	6	------	291	*227	------	295	68	55	92	b30	13,000	685
9	6	------	286	*236	------	243	61	44	110	b25	14,500	587
10	6	------	291	*246	------	216	55	37	113	b20	7,100	408
11	6	218	344	*255	------	210	50	32	110	b20	5,100	304
12	15	------	445	*265	*234	201	41	30	103	b18	3,300	256
13	129	------	505	*265	------	180	34	29	92	b16	2,100	227
14	97	------	532	*254	------	171	20	27	89	b13	1,330	197
15	70	------	541	*243	------	167	17	26	86	b 9	1,140	170
16	70	------	550	*221	------	159	15	16	86	b 5	950	
17	70	------	523	*210	------	148	13	15	*75		770	
18	70	241	496	*210	------	140	11	13	*50			
19	70	------	414	*210	------	133	12	12	*25			*180
20	68	------	370	*210	------	129	13	10				
21	66	------	313	*200	------	129	20	14				
22	63	------	313	*200	------	126	35	12				
23	63	------	363	*200	------	126	44	12	*10			184
24	63	------	390	*200	------	123	44	10		* 4	*328	167
25	63	------	414		------	110	44	9				154
26	63	------	445	*190	------	97	44	8				144
27	63	------	445		------	92	46	9	b28			132
28	97	------	452		------	100	50	10	b100			122
29	92	------	460	184	------	119	52	11	b30			*125
30	*92	------	469	*190	------	110	39	22	b15			*130
31	*92	------	496	*190	------	110	------	39	------			------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	129	6	49.7	3,060
November	------	------	200	11,900
December	550	286	421	25,900
January	460	184	257	15,800
February	------	------	220	12,200
March	------	92	272	16,700
April	97	11	47.8	2,840
May	66	8	29.1	1,790
June	113	10	53.5	3,180
July	35	4	11.1	682
August	14,500	3	2,050	126,000
September	685	86	195	11,600
The year	14,500	3	320	232,000

* Interpolated or estimated.
b Discharge determined from State records of canal diversions.

Digitized by Google

ARKANSAS RIVER AT GARDEN CITY, KANS.

LOCATION.—Water-stage recorder in NW. ¼ sec. 19, T. 24 S., R. 32 W., half a mile south of Garden City.

DRAINAGE AREA.—28,800 square miles.

RECORDS AVAILABLE.—June, 1922, to September, 1929.

EXTREMES.—Maximum discharge during year, 21,200 second-feet Aug. 9 (gage height, 7.74 feet); no flow in October, June, July, and August.

1922-1929: Maximum discharge occurred this year; no flow during several periods. Bank-full stage, 7.0 feet.

REMARKS.—Records good except those for Dec. 6–14, January, February, and Aug. 19 to Sept. 7, which are poor. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Aug.	Sept.
1	0	85	264	222	53	511	18	31	9	0	7
2	0	45	320	390	52	469	14	24	6	0	5
3	0	52	370	500	50	756	11	16	4	0	3
4	0	54	370	420	48	812	11	10		0	1
5	0	92	360	175	45	702	22	12		0	1
6	0	75		108	42	458	14	14	*6	525	1
7	0	54		108	38	185	11	16		640	9
8	0	52		120	34	95	11	18	9	1,240	9
9	0	56		154	30	63	13	18	7	15,900	10
10	0	54	*340	186	34	45	10	45	8	6,600	27
11	0	49		186	38	43	9	99	1	4,450	27
12	0	45		272	42	33	8	57	1	3,620	28
13	0	45		320	45	26	8	45	4	2,710	14
14	0	47		256	48	24	10	31	2	1,940	10
15	5	43	320	210	50	24	9	20	0	1,340	7
16	2	66	222	180		23	11	14	0	898	5
17	2	72	180	150		20	11	12	0	536	4
18	2	66	164	128		17	11	16	0	295	2
19	2	52	216	124		16	26	11	0	142	1
20	3	78	116	120		16	50	14	0	70	4
21	6	54	120	108	* 50	14	36	22	0	39	4
22	4	54	128	88		16	28	12	1	29	3
23	9	78	128	80		17	23	11	1	25	1
24	12	62	150	72		14	20	14	1	20	1
25	13	69	256	65		16	16	14	0	17	1
26	18	52	443	55	458	17	11	10	0	16	1
27	20	41	443	55	548	17	10	8	0	16	1
28	34	38	500	55	572	38	10	6	0	14	1
29	78	72	572	55	-------	40	8	6	0	14	1
30	66	210	524	55	-------	31	8	6	0	13	2
31	69	-------	380	55	-------	23	-------	6	-------	12	-------

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	78	0	11.1	682
November	210	38	63.7	3,790
December	572	116	310	19,100
January	500	55	164	10,000
February	572	30	97.4	5,410
March	812	14	148	9,100
April	50	8	15.2	904
May	99	6	20.6	1,270
June	9	0	2.43	145
August	15,900	0	1,330	81,800
September	27	1	6.20	369
The year	15,900	0	183	133,000

* Estimated.

NOTE.-No flow during July.

Digitized by Google

ARKANSAS RIVER AT LARNED, KANS.

LOCATION.—Water-stage recorder in NE. ¼ sec. 5, T. 22 S., R. 16 W., south of Larned, half a mile above Pawnee River.

DRAINAGE AREA.—34,900 square miles.

RECORDS AVAILABLE.—June, 1922, to September, 1929.

EXTREMES.—Maximum discharge during year, 11,400 second-feet Aug. 9 (gage height, 8.47 feet); no flow October, July, and August.

1922–1929: Maximum discharge, 14,300 second-feet Aug. 25, 1923 (gage height, 9.5 feet); no flow during several periods. Bank-full stage, 8.5 feet.

REMARKS.—Records poor; control unstable. Diversions for irrigation above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9	86			100	77	70	11	1	0	486
2	13	81			200	75	108	7	1	0	440
3	14	81			570	72	120	7	0	0	398
4	30	120			488	70	129	6	0	0	363
5	38	214	*180	*80	373	64	126	6	0	0	324
6	47	570			532	55	98	10	0	0	289
7	38	626			594	59	91	19	0	0	261
8	32	250			510	55	93	19	1	0	236
9	44	260			412	52	86		4	2	229
10	52	270			332	54	95		5	8,050	207
11	54	275			265	48	170		4	6,830	194
12	48	232			219	48	160	*14	4	5,670	182
13	48	224			190	47	165		3	4,570	163
14	54	232	*150		182	59	170		3	3,550	153
15	52	260		*70	174	59	100		1	2,760	135
16	81	360			170	55	54		0	2,030	130
17	114	349			160	52	39	7	0	1,500	124
18	108	322			132	52	30	7	17	1,210	122
19	91	412			114	55	26	4	14	1,080	113
20	83	214	120		108	64	25	2	3	1,050	111
21	81	224	100		103	86	21	2	0	1,030	96
22	75	219	90		95	77	18	1	0	961	92
23	70	219	80		93	73	15	5	0	934	86
24	66	224	70		86	68	13	21	0	880	80
25	75	255	75	*60	79	57	13	10	0	856	75
26	88	270			77	62	9	7	0	784	70
27	77	190			79	60	7	5	0	736	
28	70	190	*70		77	50	6	3	0	690	
29	79	232			81	47	4	2	0	645	*70
30	77	295		-------	79	44	6	1	0	603	
31	-------	295		-------	73	-------	13	-------	0	554	

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
November	114	9	60.2	3,580
December	626	81	260	16,000
January	----------	----------	132	8,120
February	----------	----------	70.7	3,930
March	594	73	218	13,400
April	86	44	59.8	3,560
May	170	4	67.1	4,130
June	21	1	9.13	543
July	17	0	1.97	121
August	8,050	0	1,520	93,500
September	486	70	181	10,800
The year	8,050	0	217	158,000

* Estimated.

NOTE.—No flow during October.

Digitized by Google

ARKANSAS RIVER NEAR WICHITA, KANS.

LOCATION.—Chain gage near center of section line between secs. 7 and 18, T. 27 S., R. 1 E., 1½ miles above mouth of Little Arkansas River.

DRAINAGE AREA.—40,300 square miles.

RECORDS AVAILABLE.—June, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 7,530 second-feet July 14 (gage height, 12.48 feet); minimum, 71 second-feet Oct. 2; minimum gage height, 6.58 feet Sept. 28.

1921–1929: Maximum discharge, 12,000 second-feet Aug. 18, 1927 (gage height, 14.77 feet); no flow during periods in several years. Bank-full stage, 14 feet.

REMARKS.—Records good except those for period Nov. 16 to May 15, which are fair.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	108	158	850			985	469	439	885	455	425	344
2	82	211	850			1,180	502	409	1,180	455	397	344
3	108	228	850			1,230	439	382	1,490	455	397	320
4	94	228	895			1,330	382	409	1,830	397	370	296
5	108	246	850			1,440	409	439	2,330	370	344	296
6	112	265	805			1,440	382	469	2,330	397	344	274
7	99	265	850			1,230	355	535	1,950	397	344	274
8	94	265	805	*700		940	331	570	1,600	425	370	296
9	90	286	*805			760	331	502	1,280	530	397	296
10	94	265	805			760	331	502	1,180	530	455	296
11	94	265	850		*500	895	331	469	1,060	575	625	296
12	108	265	850			895	307	502	975	975	3,610	296
13	103	265	*872			850	286	680	885	3,250	2,920	274
14	105	307	895			720	286	2,730	735	6,890	2,620	274
15	122	307	850			760	307	3,790	625	6,270	2,470	274
16	126	535	*872			535	331	5,870	490	4,710	2,200	274
17	122	805	895			680	331	4,520	455	3,250	1,950	274
18	129	985	*895			680	307	3,430	425	2,070	1,710	254
19	194	1,130	895			638	331	2,620	425	1,600	1,060	254
20	175	1,330	1,230			605	307	2,070	425	1,280	885	254
21	211	1,330	940		469	570	331	1,600	425	1,280	735	254
22	163	1,180	895		680	535	331	1,490	425	1,280	625	254
23	158	1,060	*828	*600	895	502	331	1,180	625	1,280	530	254
24	150	940	760		805	535	331	885	975	1,280	490	234
25	147	940	*720		895	502	286	805	975	885	455	234
26	147	940	680		805	502	331	675	735	625	455	234
27	136	895	720		720	439	439	675	530	530	425	225
28	136	850	760		850	409	502	625	455	490	397	216
29	150	940	*720		-------	409	502	625	425	455	397	216
30	158	850			-------	409	439	675	425	455	370	216
31	169	-------			-------	439	-------	805	-------	425	344	-------

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	211	82	129	7,930
November	1,330	158	619	36,800
December	1,230	680	837	51,500
January			648	39,800
February			576	32,000
March	1,440	409	768	47,200
April	502	286	363	21,600
May	5,870	382	1,330	81,800
June	2,330	425	952	56,600
July	6,890	370	1,430	87,900
August	3,610	344	940	57,800
September	344	216	270	16,100
The year	6,890	82	742	537,000

* Interpolated or estimated.

Digitized by Google

ARKANSAS RIVER AT ARKANSAS CITY, KANS.

LOCATION.—Chain gage in NW. ¼ sec. 25, T. 34 S., R. 3 E., half a mile west of Arkansas City and 5 miles above mouth of Walnut River.

DRAINAGE AREA.—44,700 square miles.

RECORDS AVAILABLE.—September, 1902, to July, 1906; September, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 20,200 second-feet June 24 (gage height, 16.60 feet); minimum, 189 second-feet Oct. 6 (gage height, 6.74 feet). 1902–1905, 1921–1929: Maximum stage, 25.46 feet June 11, 1923 (discharge not determined); minimum discharge, 12 second-feet in March and April, 1923, due to diversion by power canal of Kansas Gas & Electric Co.

REMARKS.—Records good except those for period Aug. 15 to Sept. 30, which are fair. Diversions from Arkansas River cease about 250 miles upstream.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	250	390	1,140	930	930	1,140	930	1,140	1,210	1,600	1,210	*595
2	230	440	*1,100	930	860	1,210	930	1,140	*4,700	1,600	1,140	490
3	234	440	1,070	670	*895	*1,320	860	2,200	8,200	2,650	1,070	490
4	226	*440	1,000	640	930	1,430	860	1,600	6,820	*2,230	*1,000	520
5	196	440	1,000	790	930	1,510	860	1,140	7,260	1,810	930	520
6	189	440	930	*790	930	1,510	860	*1,140	7,490	1,700	930	490
7	*252	465	930	790	930	1,430	*842	1,140	7,260	1,510	860	440
8	315	465	930	790	760	1,350	825	1,600	13,400	2,060	825	*465
9	270	490	*930	*3,380	730	1,350	825	1,210	10,100	1,600	*842	490
10	270	440	930	5,980	*865	*1,320	825	1,070	6,820	8,200	860	465
11	250	*452	930	5,020	1,000	1,280	1,140	1,070	4,500	8,450	*1,070	465
12	226	465	930	4,180	1,000	1,430	1,140	*3,520	3,860	5,580	1,280	490
13	242	490	1,000	*3,060	1,000	1,600	1,280	5,980	3,100	8,200	2,200	465
14	*228	490	1,140	1,930	930	1,430	*1,440	4,180	2,350	9,460	3,700	440
15	214	520	1,140	1,810	930	1,350	1,600	3,250	2,060	9,980	3,250	*480
16	270	670	*1,820	1,600	1,000	1,280	1,350	4,500	*1,830	10,500	3,250	520
17	270	8,950	2,500	1,430	*965	*1,210	1,210	6,610	1,600	10,200	2,500	550
18	290	9,200	3,250	1,430	930	1,140	1,140	5,200	1,430	7,720	*2,160	490
19	290	6,820	2,500	1,430	825	1,070	1,000	5,390	1,430	5,580	1,810	520
20	270	5,200	1,350	*1,430	730	1,000	12,100	4,670	1,430	4,020	1,600	490
21	*318	3,250	1,280	1,430	825	1,000	6,820	3,400	1,350	*3,560	1,350	490
22	365	2,350	1,210	1,210	1,140	1,000	5,020	2,650	1,280	3,100	1,280	*465
23	340	1,810	*1,180	1,280	1,140	930	2,650	2,060	9,980	2,500	1,140	440
24	315	1,600	1,140	1,430	*1,140	*930	1,810	1,810	19,500	2,350	1,070	415
25	340	*1,480	*1,100	860	1,140	930	1,700	1,600	15,400	2,200	*1,000	415
26	340	1,350	1,070	700	1,210	930	2,060	*1,520	8,950	1,930	930	415
27	315	1,280	1,070	*850	1,280	930	1,430	1,430	5,580	1,600	860	390
28	*328	1,140	1,000	1,000	1,210	930	*1,320	1,070	3,860	*1,520	825	390
29	340	1,140	1,000	1,000	-------	930	1,210	1,350	2,800	1,430	760	390
30	340	1,140	1,000	1,000	-------	860	1,140	*1,320	*2,200	1,350	730	365
31	340	-------	1,000	1,000	-------	*895	-------	1,280	-------	1,280	700	------

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	365	189	280	17,200
November	9,200	390	1,810	108,000
December	3,250	930	1,240	76,200
January	5,980	640	1,640	101,000
February	1,280	730	970	53,900
March	1,600	860	1,180	72,600
April	12,100	825	1,910	114,000
May	6,610	1,070	2,490	153,000
June	19,500	1,210	5,590	333,000
July	10,500	1,280	4,110	253,000
August	3,700	700	1,390	85,500
September	595	365	468	27,800
The year	19,500	189	1,930	1,400,000

*Interpolated.

Digitized by Google

ARKANSAS RIVER AT VAN BUREN, ARK.

LOCATION.—Chain gage in sec. 24, T. 9 N., R. 32 W., at Van Buren, 1½ miles below Lee Creek. Zero of gage is 372.67 feet above mean sea level.
RECORDS AVAILABLE.—October, 1927, to September, 1929.
EXTREMES.—Maximum discharge during year, 315,000 second-feet May 16 (gage height, 29.0 feet); minimum, 3,380 second-feet Oct. 2–8 (gage height, 6.6 feet).

1928–29: Maximum discharge, 315,000 second-feet May 16, 1929 (gage height, 29.0 feet); minimum, 3,380 second-feet Oct. 2–8, 1928 (gage height, 6.6 feet).

Maximum stage known, 35.0 feet in April, 1927.
REMARKS.—Records poor Oct. 1 to Mar. 31; good Apr. 1 to Sept. 30.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,780	7,200	58,000	13,900	21,300	62,800	95,000	104,000	62,700	39,000	10,100	4,810
2	3,380	8,140	47,200	13,300	18,700	59,200	69,500	99,900	82,300	34,400	9,650	4,650
3	3,380	8,620	24,100	12,700	17,500	46,000	50,000	87,100	85,900	72,700	9,250	4,350
4	3,380	8,140	17,500	12,700	16,900	35,000	36,000	63,800	102,000	97,300	8,850	4,350
5	3,380	7,660	15,700	13,900	16,300	27,600	28,300	47,000	138,000	88,300	8,150	4,350
6	3,380	6,740	14,500	24,100	16,300	24,100	26,600	46,000	168,000	73,900	7,800	4,350
7	3,380	6,740	13,300	52,000	16,900	21,300	29,100	51,000	156,000	64,900	7,500	4,350
8	3,380	6,740	12,700	70,000	17,500	19,300	27,400	47,000	130,000	56,100	7,200	5,290
9	5,000	6,300	12,100	62,800	17,500	17,500	53,000	77,500	138,000	63,800	6,900	7,200
10	7,200	5,860	11,100	50,800	15,100	15,700	104,000	140,000	152,000	71,500	6,650	7,500
11	8,140	5,860	11,100	48,400	11,600	15,100	148,000	164,000	135,000	68,200	6,650	26,600
12	7,660	5,420	10,100	54,400	11,600	14,500	134,000	143,000	115,000	60,500	6,400	22,700
13	6,300	5,420	10,600	65,200	13,300	18,700	93,400	184,000	105,000	43,000	6,400	17,800
14	5,000	5,860	11,100	64,000	15,700	48,400	66,000	278,000	113,000	51,000	6,650	16,000
15	4,580	5,420	11,600	76,000	17,500	56,800	73,900	300,000	109,000	82,300	6,650	10,100
16	4,580	5,420	15,700	68,800	18,700	64,000	152,000	315,000	96,000	66,000	7,200	8,150
17	5,420	14,500	32,800	50,800	19,300	47,200	171,000	303,000	62,700	56,100	9,250	6,900
18	6,740	23,400	62,800	35,000	21,300	40,500	126,000	283,000	44,000	55,000	10,100	6,000
19	6,740	22,700	95,500	29,600	22,700	31,700	98,600	259,000	35,300	43,000	11,600	5,630
20	6,300	35,000	105,000	26,600	22,000	24,900	85,900	254,000	30,000	43,600	12,600	5,460
21	5,860	94,200	89,000	24,900	21,300	22,700	93,400	292,000	26,600	40,000	10,600	4,810
22	5,420	110,000	82,500	23,400	19,900	20,600	154,000	295,000	40,000	39,000	8,850	4,500
23	7,660	116,000	71,200	22,700	18,100	18,100	194,000	244,000	68,200	38,100	7,800	4,350
24	8,140	101,000	44,900	32,800	17,500	16,900	220,000	194,000	77,500	34,400	7,200	4,350
25	7,200	87,700	31,700	91,600	18,100	15,100	207,000	143,000	78,700	25,800	7,200	4,650
26	7,200	79,900	23,400	90,300	26,600	13,900	166,000	140,000	82,300	19,200	6,400	4,810
27	7,200	76,000	20,600	76,000	37,200	16,900	159,000	143,000	105,000	19,200	6,000	4,350
28	6,740	62,800	19,300	72,400	43,800	22,000	134,000	143,000	87,100	14,800	5,460	4,050
29	6,740	56,800	17,500	53,200	-------	29,600	119,000	113,000	68,200	13,200	5,290	3,900
30	8,620	60,400	16,900	37,200	-------	68,800	110,000	94,700	51,000	12,000	5,130	3,760
31	7,660	-------	15,100	24,100	-------	102,000	-------	77,500	-------	11,000	4,970	-------

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	8,620	3,380	5,790	356,000
November	116,000	5,420	34,900	2,080,000
December	105,000	10,100	33,100	2,040,000
January	91,600	12,700	45,000	2,770,000
February	43,800	11,600	19,600	1,090,000
March	102,000	13,900	33,400	2,050,000
April	220,000	26,600	107,000	6,370,000
May	315,000	46,000	165,000	10,100,000
June	168,000	26,600	91,500	5,440,000
July	97,300	11,000	48,400	2,960,000
August	12,600	4,970	7,760	477,000
September	26,600	3,760	7,340	437,000
The year	315,000	3,380	50,100	36,200,000

Digitized by Google

ARKANSAS RIVER AT LITTLE ROCK, ARK.

LOCATION.—Staff gage in sec. 3, T. 1 N., R. 12 W., in Little Rock. Zero of gage is 223.39 feet above mean sea level.

RECORDS AVAILABLE.—September, 1927, to September, 1929.

EXTREMES.—Maximum discharge during year, 275,000 second-feet May 19 (gage height, 23.3 feet); minimum, 4,160 second-feet Oct. 8–12 (gage height, −0.3 foot).

1928–1929: Maximum discharge, 275,000 second-feet May 19, 1929 (gage height, 23.3 feet); minimum, 4,160 second-feet Oct. 8–12 (gage height, −0.3 foot).

Maximum stages known, 34.6 feet in June, 1833; 33.0 feet Apr. 20, 1927.

REMARKS.—Records good. Gage-height record furnished by United States Weather Bureau.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5,030	8,260	75,000	21,300	72,000	83,000	87,100	132,000	120,000	77,000	14,400	7,450
2	4,730	9,620	74,000	19,800	59,400	90,400	113,000	130,000	95,000	60,500	14,100	7,450
3	4,730	13,800	70,000	17,800	54,700	97,000	107,000	126,000	80,600	45,200	13,400	6,990
4	4,440	13,800	61,200	17,000	39,200	94,800	95,900	123,000	97,400	48,800	12,500	6,990
5	4,730	12,400	44,100	16,500	33,200	88,200	84,000	107,000	109,000	77,000	11,400	6,760
6	4,440	11,700	31,800	20,800	28,400	77,000	70,000	83,000	118,000	98,600	11,400	6,530
7	4,440	10,600	25,200	47,500	25,800	68,000	59,400	62,700	145,000	98,600	10,900	6,530
8	4,160	9,620	20,300	53,800	25,200	58,400	52,000	55,500	163,000	86,600	10,600	6,530
9	4,160	9,280	18,300	72,000	25,800	50,200	56,500	64,900	156,000	87,800	10,100	6,300
10	4,160	8,940	16,100	85,000	27,000	42,400	95,900	75,900	144,000	80,600	9,840	6,300
11	4,160	7,920	15,300	84,000	27,000	35,400	113,000	116,000	144,000	71,500	9,590	7,680
12	4,160	7,920	14,900	76,000	25,800	30,400	146,000	151,000	152,000	75,900	9,590	8,380
13	5,650	7,590	15,300	66,000	22,400	27,000	160,000	165,000	144,000	75,900	9,100	8,620
14	7,260	7,590	22,400	68,000	20,800	27,000	143,000	158,000	125,000	58,500	9,100	17,800
15	8,260	6,930	39,200	75,000	20,800	33,200	122,000	192,000	117,000	50,600	8,860	19,800
16	8,260	6,600	38,400	77,000	24,000	56,500	108,000	226,000	117,000	46,100	8,860	18,200
17	7,920	6,600	39,200	84,000	27,700	74,000	118,000	254,000	117,000	77,000	8,620	16,700
18	7,260	6,280	45,800	81,000	30,400	79,000	159,000	266,000	105,000	73,700	8,620	12,500
19	7,920	8,260	71,000	76,000	30,400	68,000	164,000	275,000	77,000	60,500	8,620	10,400
20	7,590	18,800	94,800	67,000	31,800	60,300	154,000	272,000	51,500	55,500	9,340	9,100
21	6,930	25,800	113,000	58,400	36,100	52,000	120,000	263,000	40,100	50,600	10,600	8,620
22	7,920	33,900	109,000	52,000	36,800	50,200	109,000	254,000	33,200	43,400	12,000	7,910
23	7,920	82,000	99,200	44,100	35,400	48,400	114,000	260,000	29,100	40,100	12,000	7,910
24	7,260	98,100	91,500	40,800	35,400	43,200	151,000	266,000	44,300	37,700	12,200	7,680
25	6,930	100,000	80,000	56,500	36,800	37,600	178,000	251,000	83,000	36,900	10,600	7,450
26	6,600	91,500	65,000	132,000	44,100	32,500	194,000	215,000	93,800	33,900	10,400	6,530
27	7,920	81,000	51,100	132,000	83,000	30,400	192,000	187,000	90,200	29,800	9,840	6,300
28	8,600	76,000	38,400	121,000	80,000	27,700	168,000	178,000	90,200	22,600	8,860	6,300
29	8,260	70,000	31,100	113,000	-------	37,600	162,000	185,000	107,000	18,200	8,620	6,300
30	8,600	66,000	25,800	102,000	-------	45,800	144,000	165,000	92,600	17,800	8,140	6,070
31	8,260	-------	24,000	88,200	-------	56,500	-------	140,000	-------	15,000	7,450	-------

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	8,600	4,160	6,410	394,000
November	100,000	6,280	30,600	1,820,000
December	113,000	14,900	50,300	3,090,000
January	132,000	16,500	66,600	4,100,000
February	83,000	20,800	37,100	2,060,000
March	97,000	27,000	54,900	3,380,000
April	194,000	52,000	125,000	7,440,000
May	275,000	55,500	174,000	10,700,000
June	163,000	29,100	103,000	6,130,000
July	98,600	15,000	56,500	3,470,000
August	14,400	7,450	10,300	633,000
September	19,800	6,070	8,940	532,000
The year	275,000	4,160	60,400	43,700,000

Digitized by Google

PAWNEE RIVER NEAR LARNED, KANS.

LOCATION.—Water-stage recorder in sec. 33, T. 21 S., R. 18 W., at Moffet Dam, 11½ miles west of Larned.

DRAINAGE AREA.—Approximately 2,300 square miles.

RECORDS AVAILABLE.—November, 1924, to September, 1929.

EXTREMES.—Maximum discharge during year, 3,880 second-feet May 13 (gage height, 21.70 feet); minimum, about 2 second-feet several days in October. 1924–1929: Maximum discharge this year; no flow at times in 1926. Bank-full stage, 24 feet.

REMARKS.—Records good except those for parts of March, May, June, August, and September, which are poor. Diversions for irrigation by pumping above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3	18	11	10	9		8	9		9	22	
2	3	16	12	9	10		9	9		8	19	
3	3	15	10	10	11	*13	9	12		8	7	*6
4	3	18	10	10	11		9	14		8	4	
5	3	15	9	9	12		10	19		8	4	
6	2	14	9	9	12		8	19		9	4	
7	3	12	10	9	9		9	14		15	3	
8	4	11	10	9	9	*12	8	13		495	3	*10
9	4	11	10	10	8		8	12		450	4	
10	4	10	12	13	9		6	18	*15	332	8	
11	3	9	12	22	8		7	459		169	51	
12	3	8	12	21	10		8	780		104	301	
13	4	8	13	20	9	*11	7	3,030		55	372	*15
14	4	9	12	18	15		10	2,600		42	126	
15	5	8	12	14	15		8	907		34	48	
16	5	10	12	14	16		8	*500		29	31	16
17	9	10	12	14	15		9	*300		27	23	13
18	18	12	12	14	16	*10	9	*200		33	20	10
19	16	14	12	14	20		9	*100	22	28	17	10
20	11	13	12	10	23		10	*50	20	23	13	9
21	9	15	14	14	20		7		15	22	8	9
22	5	13	12	15	16		7		13	22	6	9
23	5	12	12	12	16	*9	10	*30	11	20		8
24	6	12	12	12	*16		15		13	20		7
25	6	11	12	11	*16		8		15	22		7
26	6	12	14	11		8			10	21	*6	6
27	7	12	12	11	*15	8			11	21		5
28	7	11	14	10		8	*8	*25	11	22		5
29	7	12	13	10	------	8			9	27		5
30	7	10	13	9	------	8			9	25		5
31	10	------	14	9	------	7	------	------	------	22	------	------

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	18	------	5.97	367
November	18	8	12.0	714
December	14	9	11.8	701
January	22	9	12.4	762
February	23	8	13.4	744
March	------	------	10.4	640
April	15	6	8.53	508
May	3,030	9	302	18,600
June	------	------	14.3	851
July	495	8	68.6	4,220
August	372	------	37.0	2,280
September	------	------	9.30	553
The year	3,030	------	42.7	30,900

* Interpolated or estimated.

Digitized by Google

LITTLE ARKANSAS RIVER AT VALLEY CENTER, KANS.

LOCATION.—Chain gage in SW. ¼ sec. 1, T. 26 S., R. 1 W., 1 mile south of Valley Center and 14 miles above mouth.

DRAINAGE AREA.—1,340 square miles.

RECORDS AVAILABLE.—June, 1922, to September, 1929.

EXTREMES.—Maximum discharge during year, 7,980 second-feet July 12 (gage height, 15.91 feet); minimum, 38 second-feet Oct. 5 and 6 (gage height, 0.88 foot).

1922–1929: Maximum discharge, 10,500 second-feet June 10, 1923 (gage height, 18.02 feet); minimum discharge, 4 second-feet Dec. 17, 1922. Bankfull stage, 10 feet.

REMARKS.—Records good except those for periods of ice effect, Jan. 23 to Feb. 13, and for June, August, and September, which are fair. Discharge estimated Jan. 23 to Feb. 13.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	38	47	64	57		189	54	64	850	106	130	72
2	38	47	64	57		297	50	68	1,940	95	123	68
3	38	47	64	57		348	50	81	3,620	90	111	68
4	38	47	64	57		348	50	72	4,740	81	106	64
5	38	47	60	57	50	218	50	68	4,260	72	100	64
6	38	47	57	60		142	50	64	3,220	68	100	64
7	38	47	57	64		111	50	64	2,630	64	100	68
8	38	47	57	64		95	50	60	2,040	64	95	68
9	38	47	57	64		90	50	57	1,510	81	265	68
10	38	47	67	162		81	57	57	1,160	81	652	68
11	38	47	57	175	40	72	90	57	700	2,700	249	68
12	38	47	57	203		68	72	72	428	7,980	536	68
13	38	47	60	189		72	64	90	386	6,120	2,970	64
14	38	50	60	130	50	68	57	850	265	4,660	249	64
15	38	50	60	123	50	64	57	1,640	203	5,060	162	64
16	41	57	66	111	54	64	54	1,560	162	5,400	130	60
17	41	297	68	90	57	60	50	514	136	3,460	111	60
18	57	1,690	72	81	76	60	54	233	123	1,460	100	60
19	64	1,240	64	90	90	57	54	189	117	900	95	60
20	50	386	60	111	81	57	57	149	106	676	90	60
21	44	203	60	100	76	57	925	162	90	514	86	57
22	44	130	60	95	72	57	582	123	86	386	86	57
23	44	106	60		90	57	265	111	90	297	86	57
24	41	90	57		100	54	218	100	605	249	81	54
25	41	81	57		142	54	136	106	850	218	81	54
26	41	72	57	70	149	54	100	100	700	189	81	50
27	41	72	57		111	50	90	90	428	175	81	50
28	41	68	57		149	50	81	86	297	156	81	50
29	41	68	57		-------	50	72	81	189	156	76	50
30	41	64	57		-------	54	68	81	136	142	76	50
31	44	-------	57		-------	50	-------	86	-------	162	76	-------

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	64	38	41.5	2,550
November	1,690	47	178	10,600
December	72	57	59.8	3,680
January	203	----------	91.2	5,610
February	149	----------	69.2	3,840
March	348	50	102	6,270
April	925	50	122	7,260
May	1,640	57	230	14,100
June	4,740	86	1,070	63,700
July	7,980	64	1,350	83,000
August	2,970	76	238	14,600
September	72	50	61.0	3,630
The year	7,980	38	302	219,000

Digitized by Google

WALNUT RIVER AT WINFIELD, KANS.

LOCATION.—Chain gage in NE. ¼ sec. 33, T. 32 S., R. 4 E., 1 mile south of Winfield and 1 mile above Black Creek.

DRAINAGE AREA.—1,860 square miles.

RECORDS AVAILABLE.—November, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 94,400 second-feet Nov. 18 (gage height, 40.61 feet); no flow Nov. 11.

1921–1929: Maximum and minimum, those of 1928. Bank-full stage, 30 feet.

REMARKS.—Records good except those for August and September, which are fair.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17	2	630	457	436	436	355	630	855	395	279	93
2	17	12	585	457	436	436	335	1,830	1,660	5,800	244	85
3	9	17	585	457	457	395	316	3,680	3,100	2,000	244	103
4	1	12	541	585	436	375	316	1,500	2,320	765	244	93
5	1	30	520	2,100	436	355	316	855	1,830	520	211	19
6	1	24	520	1,940	436	335	261	1,350	1,100	436	205	38
7	180	17	478	1,200	457	316	261	4,220	3,740	436	186	49
8	316	11	478	1,250	395	335	244	2,100	5,870	478	186	49
9	164	8	478	2,490	436	316	227	810	2,380	8,180	186	103
10	114	6	478	9,860	415	316	244	810	1,200	13,800	205	120
11	45	0	457	11,400	395	297	1,350	810	765	13,400	3,500	98
12	41	20	436	5,730	395	1,000	1,560	8,530	630	5,730	1,150	93
13	24	9	585	2,100	375	2,440	675	6,570	520	8,460	585	93
14	19	9	630	1,560	375	1,500	436	2,160	436	4,400	335	85
15	30	6	1,450	1,250	375	855	630	1,100	585	1,100	261	112
16	34	950	1,050	950	375	585	585	1,000	499	900	211	103
17	395	25,000	6,640	1,100	375	541	457	950	395	675	195	103
18	585	71,800	6,220	855	375	478	415	1,940	375	900	180	112
19	205	33,200	2,160	1,050	355	415	478	7,090	855	1,250	170	85
20	173	15,500	1,300	1,200	375	415	14,600	3,260	675	675	170	103
21	20	1,880	900	855	355	395	19,100	1,250	1,050	585	149	103
22	49	1,250	855	810	375	355	10,300	900	950	478	140	38
23	30	1,050	765	675	355	355	1,940	765	2,000	436	131	85
24	17	900	765	675	355	355	1,300	720	4,960	375	131	98
25	13	810	675	585	355	355	1,300	630	3,620	335	131	78
26	9	765	630	585	355	335	1,250	630	1,830	355	126	61
27	12	720	585	585	375	316	855	585	855	316	103	68
28	6	675	585	541	395	316	720	541	630	316	103	61
29	2	675	541	499	-------	316	675	520	541	279	98	68
30	8	630	520	478	-------	316	585	520	520	297	103	68
31	2	-------	499	457	-------	316	-------	520	-------	279	112	------

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	585	1	81.9	0.044	0.05	5,040
November	71,800	0	5,200	2.80	3.12	309,000
December	6,640	436	1,080	.581	.67	66,400
January	11,400	457	1,770	.952	1.10	109,000
February	457	355	394	.212	.22	21,900
March	2,440	297	512	.275	.32	31,500
April	19,100	227	2,070	1.11	1.24	123,000
May	8,530	520	1,920	1.03	1.19	118,000
June	5,870	375	1,560	.839	.94	92,800
July	13,800	279	2,400	1.29	1.49	148,000
August	3,500	98	331	.178	.21	20,400
September	120	19	82.2	.044	.05	4,890
The year	71,800	0	1,450	.780	10.60	1,050,000

Digitized by Google

VERDIGRIS RIVER AT INDEPENDENCE, KANS.

LOCATION.—Chain gage in NE. ¼ sec. 31, T. 32 S., R. 16 E., 2½ miles below Elk River.

DRAINAGE AREA.—2,800 square miles.

RECORDS AVAILABLE.—April to September, 1904; November, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 69,500 second-feet Nov. 19 (gage height, 43.93 feet); minimum, 22 second-feet Nov. 12 (gage height, 1.30 feet).

1904, 1921–1929: Maximum discharge, 124,000 second-feet Oct. 3, 1927 (gage height, 46.04 feet); minimum discharge, 0.1 second-foot Aug. 11, 1926. Bank-full stage, 36 feet.

REMARKS.—Records good except those for Jan. 17–31, February, and September, which are fair. Discharge estimated Jan. 17–22, 24–31, and Feb. 1–28.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	56	212	880	600		600	810	1,830	4,190	570	200	102
2	66	225	810	880		600	775	1,940	8,320	7,360	175	90
3	81	225	775	990		570	740	4,470	13,700	6,990	175	68
4	84	212	740	1,240		570	670	2,710	8,320	6,780	188	51
5	66	188	670	1,570		540	570	2,320	5,590	705	200	49
6	98	150	635	10,000	600	480	570	4,890	7,060	510	188	44
7	84	130	600	7,600		480	570	18,300	5,590	2,490	225	42
8	44	84	570	6,850		510	5,730	21,200	7,760	2,440	200	40
9	38	52	540	9,200		510	2,490	11,400	6,080	1,380	188	34
10	28	38	480	12,400		880	4,050	2,760	2,380	3,460	288	44
11	32	36	540	17,600		950	4,820	1,780	1,200	11,500	635	41
12	58	22	540	11,700		1,200	5,380	28,100	880	3,220	740	47
13	63	25	510	5,940		1,280	6,780	46,100	880	4,890	600	51
14	102	24	540	3,340		3,340	12,900	31,200	845	6,290	390	49
15	98	250	3,340	2,320	500	3,520	11,600	19,500	740	2,760	238	39
16	130	1,380	7,920	1,380		2,220	2,320	2,820	670	1,240	175	35
17	114	16,300	17,800			1,670	2,100	2,270	635	780	175	28
18	118	28,900	18,900			1,570	1,780	3,980	540	740	130	53
19	126	63,700	10,000			1,420	4,120	18,700	880	635	114	57
20	140	34,700	3,840	1,200		1,280	28,300	20,300	2,000	705	130	88
21	162	21,300	2,820			990	46,800	4,260	2,270	570	106	68
22	175	15,700	1,570		465	845	35,300	2,270	4,680	450	112	37
23	162	13,600	1,470	1,030		775	23,300	2,050	2,440	420	126	29
24	175	3,980	1,110			670	13,000	1,620	1,780	390	116	53
25	175	1,330	1,070			670	25,300	1,520	2,320	390	96	55
26	150	1,280	1,030		570	775	19,200	4,050	1,670	315	69	57
27	140	1,110	1,070	800	600	880	3,580	2,270	1,200	300	78	55
28	162	915	1,030		570	990	4,120	1,940	810	288	81	55
29	200	880	1,110		-------	880	2,320	1,620	705	330	122	28
30	140	775	1,070		-------	810	1,830	1,520	540	275	175	28
31	140	-------	990		-------	915	-------	1,720	-------	212	122	------

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	200	28	110	0.039	0.04	6,760
November	63,700	22	6,920	2.47	2.76	412,000
December	18,900	510	2,740	.978	1.13	168,000
January	17,600	----------	3,490	1.25	1.44	215,000
February	----------	----------	536	.192	.20	29,800
March	3,520	480	1,080	.386	.44	66,400
April	46,800	570	9,060	3.24	3.62	539,000
May	46,100	1,520	8,760	3.13	3.61	538,000
June	13,700	540	3,220	1.15	1.28	192,000
July	11,500	212	2,240	.800	.92	138,000
August	740	69	212	.076	.09	13,000
September	102	28	50.6	.018	.02	3,010
The year	63,700	22	3,210	1.14	15.48	2,320,000

Digitized by Google

NEOSHO RIVER NEAR IOLA, KANS.

LOCATION.—Water-stage recorder in NE. ¼ sec. 9, T. 25 S., R. 18 E., 3 miles southwest of Iola and half a mile below Elm Creek.

DRAINAGE AREA.—3,800 square miles.

RECORDS AVAILABLE.—October, 1917, to September, 1929. August, 1895, to November, 1903, at city water and power dam 4 miles upstream.

EXTREMES.—Maximum discharge during year, 35,200 second-feet Nov. 20 (gage height, 30.42 feet); minimum, 82 second-feet Oct. 3 (gage height, 2.97 feet). 1895–1903, 1917–1929: Maximum discharge, 46,000 second-feet Sept. 13, 1926 (gage height, 33.2 feet); no flow on several days in September and October, 1897. Bank-full stage, 26 feet.

REMARKS.—Records good except those for January, February, and March 1–10, which are fair and based on gage-height records obtained from Weather Bureau gage 4 miles upstream. Discharge interpolated Dec. 27 and 31.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	132	230	2,000	955	990	3,870	2,430	1,400	2,970	920	578	309
2	108	230	2,200	885	990	2,970	4,420	3,980	5,520	774	440	309
3	89	230	1,840	885	885	2,340	3,760	4,200	3,650	691	397	278
4	106	230	1,600	815	885	1,800	1,600	2,300	3,150	649	360	262
5	113	955	1,440	3,060	822	1,400	1,130	1,880	3,870	649	343	297
6	103	530	1,280	2,380	754	1,060	955	2,610	4,420	643	343	326
7	135	411	1,200	2,200	691	885	885	1,520	3,060	601	421	301
8	129	289	1,130	1,400	691	822	1,480	1,360	3,760	584	416	297
9	1,100	282	1,100	1,920	643	754	1,440	1,200	4,970	1,320	334	289
10	1,060	270	1,020	3,350	643	754	3,060	1,100	4,970	1,320	1,880	297
11	480	252	990	7,840	643	715	4,090	2,700	3,250	2,610	3,350	274
12	297	220	990	9,450	643	767	4,530	16,100	2,040	10,100	4,310	270
13	255	223	1,800	8,560	691	1,840	3,550	13,500	1,880	14,900	4,640	270
14	197	217	9,450	4,860	691	2,520	1,880	15,200	1,600	16,400	2,700	266
15	182	248	6,520	3,060	691	2,120	2,250	17,400	1,320	16,800	1,440	266
16	191	4,750	5,520	3,060	643	1,480	2,200	18,000	1,100	17,600	920	262
17	185	30,100	11,900	3,060	754	1,160	1,560	9,320	990	18,400	661	255
18	1,200	31,200	11,100	3,060	822	990	1,360	13,200	920	19,300	551	252
19	1,720	32,400	5,410	3,060	885	920	1,280	12,700	4,750	13,500	480	248
20	822	34,400	3,550	2,970	1,400	850	8,440	4,090	3,350	2,250	440	241
21	480	33,500	2,430	2,880	1,840	815	12,700	2,520	3,980	1,600	445	234
22	397	31,200	1,960	2,700	1,520	754	10,900	2,080	6,290	1,320	416	230
23	322	28,300	1,800	2,520	1,440	715	8,440	1,680	4,970	1,100	392	230
24	248	15,300	1,640	2,300	2,000	697	12,400	1,640	2,520	965	365	227
25	241	3,060	1,560	2,120	885	679	7,240	1,520	2,250	843	352	220
26	230	2,430	1,480	1,960	1,600	655	2,790	1,400	1,560	754	352	217
27	230	2,040	1,280	1,840	3,760	631	2,040	1,520	1,480	655	352	207
28	230	1,840	1,100	1,840	3,760	619	1,760	1,360	1,400	607	343	204
29	223	1,800	1,100	1,320	-------	619	1,560	1,240	1,160	562	309	191
30	197	1,800	1,800	1,120	-------	607	1,440	1,440	1,020	551	347	179
31	204	-------	1,380	1,060	-------	808	-------	1,480	-------	520	347	-------

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	1,720	89	374	0.098	0.11	23,000
November	34,400	217	8,630	2.27	2.53	514,000
December	11,900	990	2,890	.761	.88	177,000
January	9,450	815	2,860	.752	.87	176,000
February	3,760	643	1,170	.308	.32	65,000
March	3,870	607	1,210	.319	.37	74,400
April	12,700	885	3,790	.998	1.11	226,000
May	18,000	1,100	5,210	1.37	1.58	320,000
June	6,290	920	2,940	.774	.86	175,000
July	19,300	520	4,820	1.27	1.46	296,000
August	4,640	309	936	.246	.28	57,600
September	326	179	257	.068	.08	15,300
The year	34,400	89	2,930	.771	10.60	2,120,000

Digitized by Google

NEOSHO RIVER NEAR PARSONS, KANS.

LOCATION.—Chain gage in NW. ¼ sec. 22, T. 31 S., R. 21 E., 500 feet above St. Louis-San Francisco Railway bridge and 10 miles east of Parsons.

DRAINAGE AREA.—4,860 square miles.

RECORDS AVAILABLE.—October, 1921, to September, 1929.

EXTREMES.—Maximum discharge during year, 48,100 second-feet Nov. 24 (gage height, 27.53); minimum, 116 second-feet Oct. 6 and 7 (gage height, 1.85 feet).

1921–1929: Maximum discharge, 48,100 second-feet Nov. 24, 1928 (gage height, 27.53 feet); minimum discharge, 17 second-feet Dec. 3, 1921 (gage height, 1.12 feet). Bank-full stage, 24 feet.

REMARKS.—Records are good.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	162	190	2,540	1,460	1,330	4,180	1,030	1,990	1,920	1,210	970	409
2	150	190	2,380	1,520	2,060	4,090	2,860	2,220	3,180	2,140	855	364
3	148	175	2,620	1,330	1,520	3,340	4,630	4,900	10,600	1,520	800	321
4	136	175	2,380	1,580	1,390	2,700	4,000	6,340	11,500	910	745	300
5	120	175	1,990	4,720	1,330	2,220	2,220	3,180	10,300	855	695	300
6	116	460	1,780	6,780	1,270	1,780	1,520	8,080	8,680	2,220	645	321
7	116	745	1,580	5,700	1,090	1,520	1,270	17,400	8,800	4,090	595	321
8	138	500	1,520	3,820	745	1,270	3,500	8,800	6,010	1,150	595	321
9	175	400	1,390	4,450	745	1,210	4,180	4,900	4,720	1,090	800	300
10	380	320	1,330	12,300	700	1,150	6,450	2,700	5,200	2,060	645	300
11	1,150	300	1,270	15,200	700	1,030	14,100	1,920	5,400	5,700	1,650	280
12	800	282	1,270	15,300	760	1,030	7,120	23,000	3,910	3,820	3,740	280
13	500	250	1,330	13,200	800	1,850	5,200	27,400	2,700	8,200	4,900	280
14	400	235	1,330	9,640	820	2,540	6,340	29,000	2,220	12,700	5,300	205
15	282	235	9,040	5,800	850	3,180	5,100	29,300	1,990	15,200	3,340	205
16	250	265	9,520	5,100	900	2,700	4,000	27,700	1,520	16,400	1,850	241
17	220	8,080	14,300	4,180	960	1,990	3,420	25,300	1,270	17,000	1,330	241
18	220	19,800	16,200	3,660	1,460	1,520	3,020	24,800	1,210	17,700	970	241
19	235	23,200	15,300	4,000	1,330	1,330	3,260	25,100	2,780	18,500	796	241
20	2,140	26,100	8,200	4,090	1,390	1,210	24,400	24,100	6,340	18,300	684	222
21	1,270	29,000	4,630	4,180	1,920	1,090	27,400	15,200	6,010	7,000	630	241
22	1,150	36,800	3,260	4,270	2,220	970	25,100	4,450	5,000	2,460	578	241
23	855	43,200	2,700	3,500	2,060	970	18,700	3,020	6,230	1,990	578	222
24	460	47,400	2,220	3,340	1,650	970	12,200	2,540	5,300	1,650	553	222
25	440	43,900	1,920	2,140	1,460	910	20,700	2,220	2,940	1,460	480	188
26	400	39,300	1,990	-,720	3,020	1,390	21,400	2,300	2,620	1,390	456	176
27	300	25,600	1,920	2,200	3,260	1,270	7,720	2,140	1,920	1,270	456	188
28	220	6,450	1,850	2,100	4,270	970	3,500	2,140	1,650	1,150	409	188
29	205	3,100	1,780	1,920	-------	1,030	2,700	1,850	1,520	1,030	386	188
30	190	2,860	1,650	1,850	-------	970	2,140	1,650	1,390	970	364	188
31	162	-------	1,460	1,650	-------	855	-------	1,780	-------	970	364	-------

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	2,140	116	435	0.090	0.10	26,700
November	47,400	175	12,000	2.47	2.76	714,000
December	16,200	1,270	3,960	.815	.94	243,000
January	15,300	1,330	4,930	1.02	1.18	303,000
February	4,270	700	1,500	.309	.32	83,300
March	4,180	855	1,720	.354	.41	106,000
April	27,400	1,030	8,310	1.71	1.91	494,000
May	29,300	1,650	10,900	2.24	2.58	670,000
June	11,500	1,210	4,500	.926	1.03	268,000
July	18,500	855	5,550	1.14	1.31	341,000
August	5,300	364	1,200	.247	.28	73,800
September	409	176	258	.053	.06	15,400
The year	47,400	116	4,610	.948	12.88	3,340,000

Digitized by Google

NEOSHO RIVER NEAR GROVE, OKLA.

LOCATION.—Chain gage in SE. ¼ sec. 27, T. 25 N., R. 23 E., 3½ miles northwest of Grove.

RECORDS AVAILABLE.—February, 1925, to September, 1929.

EXTREMES.—Maximum discharge during year, 108,000 second-feet Apr. 21 (gage height, 29.60 feet); minimum, 558 second-feet Sept. 30 (gage height, 0.72 foot).

1925–1929: Maximum discharge, 133,000 second-feet Apr. 15, 1927 (gage height, 34.6 feet); minimum, 250 second-feet September, 1925.

REMARKS.—Records good. Slight regulation at low stages by power plants upstream.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,870	1,000	5,300	3,850	4,730	11,800	6,090	8,020	7,570	4,550	2,110	1,000
2	920	1,180	4,370	3,370	4,190	9,960	6,290	10,700	12,600	7,570	2,110	880
3	765	1,130	3,370	2,920	4,020	9,210	6,500	15,900	40,900	9,710	1,990	1,000
4	1,180	1,000	4,020	2,780	3,690	8,250	8,480	15,300	52,700	5,890	1,870	920
5	1,130	960	3,850	5,890	4,020	7,570	8,960	15,000	36,700	4,370	1,750	1,130
6	1,080	920	3,070	19,600	3,690	6,290	6,710	11,200	24,100	3,850	1,640	1,130
7	1,270	840	2,780	15,300	3,370	5,890	5,490	21,500	21,800	8,020	1,640	1,320
8	1,750	1,180	2,780	12,000	3,370	5,300	27,200	39,700	39,200	21,500	1,530	1,180
9	1,130	1,640	2,780	11,000	3,220	4,920	64,400	63,900	31,200	10,500	1,640	1,000
10	1,130	1,530	2,240	22,400	2,780	4,730	58,800	44,000	16,500	5,690	1,640	1,220
11	1,040	1,220	2,370	25,400	2,780	3,690	35,900	18,600	13,900	4,730	2,370	1,130
12	1,000	920	2,110	21,500	2,500	3,690	28,200	38,000	13,100	14,500	2,640	1,040
13	1,990	1,080	2,240	19,200	2,920	4,920	18,300	106,000	25,800	11,000	4,370	1,080
14	1,750	960	2,640	17,700	2,780	4,730	41,800	100,000	21,500	9,960	5,490	1,180
15	1,220	1,530	2,780	14,200	3,070	5,490	46,300	89,000	10,500	14,200	6,290	1,180
16	1,420	2,240	9,710	9,960	2,920	6,500	26,800	63,000	8,250	16,500	5,110	765
17	1,530	2,640	31,200	8,720	3,530	5,890	17,400	48,100	6,710	17,700	3,370	920
18	1,130	6,500	34,700	8,480	5,890	5,110	15,300	58,800	6,090	18,000	2,370	1,040
19	1,220	18,600	28,200	8,480	6,090	4,730	24,800	86,000	8,480	18,900	1,990	1,000
20	1,320	21,500	23,700	8,960	4,730	4,370	69,600	81,200	32,700	19,200	1,750	765
21	1,220	22,100	16,500	8,020	4,370	3,690	106,000	60,200	32,000	19,600	1,530	1,040
22	2,640	23,700	10,200	7,790	4,550	3,530	98,000	44,500	20,200	13,400	1,320	1,000
23	2,500	24,100	7,350	7,130	4,370	3,370	75,900	23,400	13,100	4,920	1,220	840
24	2,240	25,400	6,290	7,130	5,110	3,370	50,400	12,800	12,000	3,690	1,130	800
25	1,870	26,800	5,690	9,460	5,890	3,070	37,100	11,000	21,200	3,070	1,180	800
26	1,530	31,600	5,110	8,480	17,700	3,690	28,200	9,960	9,960	2,780	1,180	880
27	1,220	39,200	5,300	7,570	18,300	3,370	28,600	9,460	8,480	2,500	1,180	920
28	1,220	41,800	4,920	6,710	13,100	4,730	21,800	8,960	6,710	2,640	1,040	730
29	960	38,800	4,020	6,710	.....	6,290	11,000	8,480	5,490	2,240	1,080	660
30	1,130	17,100	4,020	5,890	.....	7,130	9,460	9,460	5,300	2,240	1,080	590
31	1,180	.....	3,690	5,110	.....	6,500	.....	8,250	.....	2,240	1,080	.....

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	2,640	765	1,400	86,100
November	41,800	840	12,000	714,000
December	34,700	2,110	7,980	491,000
January	25,400	2,780	10,400	640,000
February	18,300	2,500	5,270	293,000
March	11,800	3,070	5,540	341,000
April	106,000	5,490	33,000	1,960,000
May	106,000	8,020	36,800	2,260,000
June	52,700	5,300	18,800	1,120,000
July	21,500	2,240	9,210	566,000
August	6,290	1,080	2,150	132,000
September	1,320	590	971	57,800
The year	106,000	590	12,000	8,660,000

Digitized by Google

COTTONWOOD RIVER AT ELMDALE, KANS.

LOCATION.—Chain gage in NW. ¼ sec. 26, T. 19 S., R. 7 E., one-fourth mile above Middle Creek and 1 mile east of Elmdale.

DRAINAGE AREA.—1,040 square miles.

RECORDS AVAILABLE.—May, 1922, to September, 1929.

EXTREMES.—Maximum discharge during year, 16,000 second-feet July 12 (gage height, 36.60 feet); minimum, 10 second-feet Oct. 3 (gage height, 3.35 feet).

1922–1929: Maximum discharge occurred in 1929; minimum discharge, 1 second-foot July 9, 1926. Bank-full stage, 32 feet.

1904: Flood stage 36.65 feet.

REMARKS.—Records good except for period Jan. 5 to Apr. 10, which are fair. Discharges given for stages above 33 feet are poor. An unmeasurable overflow occurs at the station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	65	382	253	664	445	433	353	2,510	232	638	128
2	16	57	382	235	608	465	195	272	1,780	157	610	120
3	13	57	382	219	579	485	141	498	1,930	103	554	103
4	35	56	365	271	521	505	90	372	1,870	75	554	91
5	42	50	345	280	433	492	92	272	1,130	58	527	91
6	43	51	258	166	280	211	103	254	610	38	527	82
7	63	57	215	103	280	184	92	254	1,840	38	527	73
8	56	65	203	166	235	184	92	218	2,610	38	527	73
9	56	65	192	183	195	184	92	204	1,180	98	2,720	79
10	52	65	178	200	195	184	2,850	183	722	1,390	5,340	103
11	48	74	157	217	235	135	638	2,780	527	9,400	2,640	95
12	48	83	151	234	235	150	254	5,790	372	15,100	993	91
13	52	74	167	251	280	195	157	8,880	334	14,600	666	91
14	56	77	664	269	325	235	115	2,470	315	9,820	582	91
15	56	74	521	287	365	211	103	858	315	2,240	554	79
16	920	3,140	463	305	400	203	84	694	280	1,780	527	68
17	521	12,200	521	325	463	141	68	466	186	802	498	68
18	463	12,000	550	463	463	121	68	315	131	912	466	58
19	400	6,450	579	579	433	108	68	254	126	939	430	48
20	325	1,380	550	691	433	121	1,540	272	1,510	912	391	48
21	215	550	550	743	365	121	4,220	272	1,050	1,020	353	40
22	178	433	521	845	365	121	2,680	280	430	1,070	315	52
23	170	433	492	895	325	121	912	280	430	1,020	315	79
24	144	433	433	945	325	121	666	236	582	966	272	79
25	111	433	382	995	365	108	554	176	527	912	236	52
26	72	400	365	895	385	113	466	157	554	858	222	44
27	62	400	345	845	405	121	372	145	554	831	222	32
28	54	433	345	820	425	121	466	142	334	777	186	28
29	56	400	325	769	.....	121	527	128	166	722	186	24
30	56	400	302	643	.....	121	430	638	82	694	169	12
31	56	.....	276	691	.....	492	.....	2,820	.....	666	145	.....

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	521	13	144	0.138	0.16	8,850
November	12,200	50	1,350	1.30	1.45	80,300
December	664	151	373	.359	.42	22,900
January	995	103	480	.462	.53	29,500
February	664	195	378	.364	.38	21,000
March	505	108	214	.206	.24	13,200
April	4,220	68	619	.596	.66	36,800
May	8,880	128	998	.960	1.11	61,400
June	2,610	82	833	.801	.89	49,600
July	15,100	38	2,200	2.12	2.44	135,000
August	5,340	145	738	.710	.82	45,400
September	128	12	70.7	.068	.08	4,210
The year	15,100	12	702	.675	9.16	508,000

Digitized by Google

SPRING RIVER NEAR WACO, MO.

LOCATION.—Chain gage on line between SE. ¼ sec. 7 and NE. ¼ sec. 18, T. 29 N., R. 33 W., at highway bridge 1½ miles east of Waco. Zero of gage is 835.25 feet above mean sea level.

DRAINAGE AREA.—1,160 square miles.

RECORDS AVAILABLE.—April, 1924, to September, 1929.

EXTREMES.—Maximum discharge during year, 25,000 second-feet May 13 (gage height, 22.65 feet); minimum, 60 second-feet Sept. 28 (gage height, 1.37 feet).

1924–1929: Maximum discharge, 57,400 second-feet Aug. 17, 1927 (gage height, 28.6 feet); minimum, 22 second-feet Sept. 8, 1925 (gage height, 0.90 foot).

REMARKS.—Records good except those for discharges below 150 second-feet, which are slightly affected by regulation from gristmills. Discharge affected by ice Feb. 9–12.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	172	142	118	338	535	1,310	1,450	1,130	1,010	535	320	66
2	167	139	123	320	514	1,130	1,250	4,220	1,590	950	238	96
3	161	139	113	303	452	950	950	4,950	4,130	730	204	96
4	158	139	110	270	452	890	835	3,140	1,870	580	184	110
5	167	123	116	2,580	432	950	730	1,590	1,590	514	181	120
6	172	145	116	2,900	412	1,070	630	5,750	950	452	178	139
7	175	126	110	1,730	374	835	605	6,750	2,020	1,250	170	142
8	167	123	110	1,190	432	730	15,800	9,570	2,580	680	164	131
9	167	110	96	2,340	403	630	19,400	8,690	1,590	730	158	100
10	161	126	87	4,950	374	580	15,500	4,670	1,130	580	605	145
11	153	113	87	3,230	344	558	7,370	2,420	890	630	286	106
12	153	89	100	1,590	315	558	2,500	12,900	950	680	222	120
13	156	110	106	1,010	286	580	1,870	23,200	6,850	492	204	116
14	153	98	108	835	254	580	2,580	17,800	2,340	412	167	123
15	142	89	96	730	338	558	3,680	10,300	1,800	356	170	116
16	142	128	1,190	680	412	780	2,500	4,400	950	338	175	76
17	167	172	7,150	680	835	780	1,730	2,660	835	303	181	145
18	167	181	4,220	890	1,190	680	2,100	8,470	730	286	222	96
19	167	190	3,680	1,380	730	630	1,800	16,600	7,810	254	153	96
20	156	198	1,660	1,190	730	580	18,800	11,100	7,150	254	150	103
21	147	164	1,190	780	535	535	18,400	4,580	3,770	238	150	70
22	170	164	730	680	492	514	11,700	2,020	1,730	238	147	96
23	167	145	630	630	472	492	4,670	1,660	1,070	222	150	91
24	158	136	558	605	432	452	2,340	1,450	3,500	222	118	142
25	153	139	514	835	2,820	432	2,180	1,310	2,580	207	120	116
26	153	134	452	890	4,580	835	1,800	1,310	1,450	198	120	103
27	158	139	432	835	3,140	1,010	1,590	1,380	1,070	198	126	78
28	139	134	412	730	1,940	950	1,380	1,250	780	195	120	66
29	136	128	393	680	.....	1,190	1,310	2,740	680	190	113	83
30	145	113	356	630	.....	1,450	1,190	1,870	580	190	120	91
31	145	.....	356	580	.....	1,450	.....	1,190	.....	207	106	.....

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	175	136	158	0.136	0.16
November	198	89	136	.117	.13
December	7,150	87	823	.709	.82
January	4,950	270	1,190	1.03	1.19
February	4,580	254	865	.746	.78
March	1,450	432	796	.686	.79
April	19,400	605	4,950	4.27	4.76
May	23,200	1,130	5,840	5.03	5.80
June	7,810	580	2,200	1.90	2.12
July	1,250	190	429	.370	.43
August	605	106	185	.159	.18
September	145	66	106	.091	.10
The year	23,200	66	1,470	1.27	17.26

Digitized by Google

SHOAL CREEK NEAR JOPLIN, MO.

LOCATION.—Gage consisting of float and indicator at Grand Falls hydroelectric plant of Empire District Electric Co., in S. ½ sec. 28, T. 27 N., R. 33 W., 4 miles south of Joplin.

DRAINAGE AREA.—458 square miles.

RECORDS AVAILABLE.—April, 1924, to September, 1929.

EXTREMES.—Maximum discharge during year, 13,400 second-feet May 13 (gage height, 12.92 feet); minimum, 25 second-feet for many short periods when plant was shut down.

1924–1929: Maximum discharge, 15,100 second-feet June 10, 1928 (gage height, 13.83 feet); minimum, 13 second-feet for many short periods during 1924 and 1925 when plant was shut down.

REMARKS.—Records good for discharges below 7,000 second-feet and fair for those above. Discharge estimated Oct. 11–13 and Sept. 30. Flow regulated by Grand Falls hydroelectric plant.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	278	243	269	340	466	741	688	839	792	717	329	189
2	296	238	264	319	466	662	647	952	1,750	761	325	200
3	259	212	156	297	466	640	610	938	5,570	657	236	141
4	295	203	354	305	385	607	630	825	3,460	612	368	213
5	155	237	272	375	420	600	608	768	1,880	600	382	254
6	126	202	231	398	369	591	596	768	1,600	571	332	246
7	210	206	213	456	356	527	602	755	1,440	1,080	282	238
8	210	210	236	466	382	510	1,910	1,140	1,550	876	269	201
9	272	206	205	494	330	484	4,720	2,840	1,390	721	294	214
10	255	230	219	624	291	484	2,210	1,400	1,210	670	301	271
11	284	197	236	604	320	459	1,590	1,140	1,100	628	312	187
12	312	209	223	583	305	427	1,300	4,770	1,060	555	316	227
13	341	204	225	554	341	484	1,220	11,400	1,130	555	304	237
14	370	151	241	510	252	459	1,910	3,530	998	555	295	203
15	395	255	231	484	280	422	1,750	2,570	898	527	258	225
16	285	479	352	466	306	417	1,380	2,300	861	518	264	245
17	378	532	511	466	320	484	1,180	1,890	820	514	238	206
18	366	432	714	466	359	432	2,200	4,600	808	509	251	199
19	335	371	670	425	388	402	2,290	3,450	2,630	478	241	187
20	336	371	614	393	341	420	6,630	2,140	3,160	520	244	216
21	351	338	548	413	445	417	7,460	1,740	1,420	464	238	211
22	316	358	499	414	379	410	2,890	1,500	1,130	448	276	178
23	281	317	466	436	359	402	1,960	1,360	1,020	424	239	173
24	298	270	446	466	359	395	1,630	1,210	1,050	435	190	161
25	200	292	359	544	427	367	1,450	1,140	913	422	236	174
26	241	278	402	624	829	413	1,250	1,070	817	374	206	163
27	224	264	367	624	840	401	1,100	1,010	798	357	270	161
28	258	264	326	617	768	407	996	960	768	364	218	157
29	226	270	364	570	-------	487	923	938	757	307	213	159
30	227	270	308	527	-------	596	861	876	711	392	228	160
31	220	-------	310	493	-------	610	-------	812	-------	404	210	-------

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
October	395	126	277	0.605	0.70
November	532	151	277	.605	.68
December	714	156	349	.762	.88
January	624	297	476	1.04	1.20
February	840	252	412	.900	.94
March	741	367	489	1.07	1.23
April	7,460	602	1,840	4.02	4.48
May	11,400	755	1,990	4.34	5.00
June	5,570	711	1,450	3.17	3.54
July	1,080	307	549	1.20	1.38
August	382	190	270	.590	.68
September	271	141	200	.437	.49
The year	11,400	126	715	1.56	21.20

Digitized by Google

YAZOO RIVER BASIN

TALLAHATCHIE RIVER NEAR SARDIS, MISS.

LOCATION.—Chain gage in T. 8 S., R. 7 W. Chickasaw meridian, at highway bridge on United States Route 51, 3 miles above Illinois Central Railroad bridge and 5 miles south of Sardis.

DRAINAGE AREA.—1,680 square miles.

RECORDS AVAILABLE.—July, 1928, to September, 1929. At Batesville, 5 miles downstream, comparable record from June, 1906, to December, 1912.

EXTREMES.—Maximum discharge during period, 10,900 second-feet Mar. 26 (gage height, 20.23 feet); minimum, 318 second-feet Oct. 4 (gage height, 2.24 feet).

REMARKS.—Records fair. The Vicksburg office of United States Army Engineers furnished part of field data, and computations were made in conjunction with it.

Daily discharge, in second-feet, 1928–29

Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.
1928											
1		845	635	11		530	440	21		920	355
2		670	810	12		500	410	22	565	1,580	355
3		565	920	13		500	410	23	530	1,220	355
4		600	1,220	14		470	380	24	500	1,040	330
5		565	1,530	15		410	380	25	565	1,170	330
6		530	1,440	16		410	380	26	635	1,000	330
7		500	880	17		380	380	27	670	705	330
8		470	635	18		355	380	28	705	565	330
9		600	530	19		1,170	380	29	810	500	330
10		600	470	20		775	355	30	880	470	318
								31	960	470	

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1928–29												
1	318	440	960	600	2,700	9,310	2,920	5,120	810	600	705	355
2	318	470	920	600	1,710	9,800	2,580	3,980	740	600	635	355
3	318	500	960	635	1,300	9,170	2,310	2,800	670	670	740	330
4	318	500	1,080	670	960	7,770	2,100	2,420	670	670	810	330
5	318	565	880	920	960	6,860	1,760	3,260	635	635	565	330
6	355	600	810	845	880	4,940	1,580	3,320	635	635	565	355
7	355	565	670	845	880	4,100	1,480	3,020	600	565	565	380
8	355	500	600	960	845	3,500	1,440	3,260	705	530	530	530
9	355	470	565	1,580	880	3,440	1,620	3,920	740	470	600	635
10	355	470	530	1,040	880	3,440	1,760	5,000	845	440	920	740
11	330	470	500	1,220	880	2,800	1,710	5,600	960	410	1,300	810
12	330	440	500	1,170	920	2,580	1,760	7,000	880	380	1,580	1,060
13	318	440	530	1,350	920	2,640	2,200	7,560	705	380	1,440	2,100
14	318	440	635	1,300	920	3,680	2,800	6,580	635	355	1,400	1,660
15	318	410	635	1,170	880	3,740	3,380	5,000	600	440	1,400	1,580
16	410	410	705	960	1,080	4,640	3,260	3,740	600	635	1,300	1,580
17	775	410	1,040	810	1,000	7,840	2,750	3,140	600	2,060	960	1,760
18	740	410	1,080	880	1,170	9,450	2,480	3,080	565	1,220	670	1,860
19	705	440	1,000	1,200	1,260	8,960	2,800	2,750	530	1,400	530	1,660
20	705	440	1,080	1,040	1,300	7,140	3,560	2,160	500	1,480	500	1,350
21	670	470	1,220	1,080	1,900	5,320	3,620	1,660	470	1,350	470	960
22	600	500	1,220	1,300	1,860	4,760	2,640	1,350	470	1,120	440	705
23	500	500	1,000	1,480	1,760	7,560	1,960	1,170	470	810	410	600
24	470	470	775	1,860	1,960	8,330	1,580	1,000	440	565	410	635
25	600	470	705	2,060	4,040	9,520	1,800	1,040	470	500	380	530
26	740	440	670	2,080	7,350	10,900	1,620	1,040	705	500	355	500
27	740	440	635	2,060	7,910	10,100	1,620	1,000	880	500	355	500
28	600	470	600	2,260	7,420	8,680	2,160	1,000	1,040	500	380	500
29	470	530	600	2,530	------	6,790	3,620	960	1,040	530	355	500
30	440	1,120	565	3,020	------	5,060	5,060	920	810	565	355	470
31	440	------	565	3,140	------	4,160	------	880	------	670	355	------

Digitized by Google

Monthly discharge of Tallahatchie River near Sardis, Miss., 1928–29

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
1928					
July 22–31	960	500	682	0.406	0.15
August	1,580	355	680	.405	.47
September	1,530	318	544	.324	.36
1928–29					
October	775	318	470	.280	.32
November	1,120	410	493	.293	.33
December	1,220	500	782	.465	.54
January	3,140	600	1,380	.821	.95
February	7,910	845	2,020	1.20	1.25
March	10,900	2,530	6,350	3.78	4.36
April	5,060	1,440	2,400	1.43	1.60
May	7,560	880	3,060	1.82	2.10
June	1,040	440	681	.405	.45
July	2,060	355	716	.426	.49
August	1,580	355	709	.422	.49
September	2,100	330	855	.509	.57
The year	10,900	318	1,660	.988	13.45

YOCONA RIVER NEAR ENID, MISS.

LOCATION.—Chain gage in T. 11 S., R. 7 W. Chickasaw meridian, at highway bridge on United States Route 51, 2 miles above Illinois Central Railroad bridge and 2½ miles northeast of Enid.

DRAINAGE AREA.—560 square miles.

RECORDS AVAILABLE.—July, 1928, to September, 1929.

EXTREMES.—Maximum discharge during period, 9,840 second-feet Mar. 24 (gage height, 18.58 feet); minimum, 39 second-feet Aug. 29, 31, Sept. 2 and 4, 1929 (gage height, 0.82 foot).

REMARKS.—Records fair. The Vicksburg office of United States Army Engineers furnished part of field data, and computations were made in conjunction with it.

Daily and monthly discharge, in second-feet, 1928–29

Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.
1928				1928				1928			
1	------	77	935	12	------	61	64	22	• 93	843	56
2	------	76	396	13	------	58	65	23	90	253	54
3	------	71	216	14	------	55	64	24	117	132	53
4	------	96	132	15	------	55	64	25	110	90	51
5	------	76	103	16	------	50	156	26	90	76	51
6	------	66	90	17	------	48	124	27	96	68	49
7	------	67	84	18	------	47	78	28	156	67	52
8	------	67	78	19	------	682	63	29	110	60	53
9	------	65	72	20	------	333	58	30	90	59	52
10	------	312	71	21	96	132	57	31	78	117	------
11	------	64	67								

Digitized by Google

Daily and monthly discharge, in second-feet, of Yocona River near Enid, Miss., 1928–29—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1928-29												
1	• 51	67	272	172	253	2,530	306	4,020	136	96	810	40
2	• 51	164	172	124	216	1,220	354	1,840	122	102	232	39
3	• 50	148	132	110	207	705	312	1,220	204	232	122	41
4	• 50	90	117	110	207	960	312	860	152	474	96	39
5	• 49	84	96	660	207	1,840	292	1,750	129	160	78	42
6	• 49	78	90	484	207	1,310	272	860	122	186	60	65
7	• 48	84	90	292	198	960	253	664	284	122	78	115
8	48	103	90	190	190	660	234	1,010	1,010	115	78	474
9	47	84	84	292	272	572	594	1,890	252	317	160	108
10	48	78	84	1,190	244	506	843	885	177	122	273	90
11	47	71	90	616	207	440	912	592	136	115	239	122
12	45	72	90	306	181	440	960	985	115	152	935	242
13	44	71	181	234	181	1,900	728	530	102	84	383	2,500
14	43	69	244	181	172	4,730	506	428	252	84	405	1,260
15	49	71	148	172	333	4,970	843	428	152	122	204	451
16	78	70	132	156	889	5,130	1,340	405	122	160	102	213
17	132	71	292	156	682	2,050	935	317	102	1,540	78	177
18	64	84	528	181	484	935	797	273	90	885	71	232
19	57	117	344	462	354	660	440	252	84	428	66	222
20	54	110	181	354	506	572	418	252	90	204	59	108
21	53	90	132	292	3,020	528	312	222	78	108	53	74
22	96	78	117	462	2,010	3,370	253	195	76	84	51	58
23	84	77	110	594	1,140	9,400	292	177	72	76	50	56
24	103	77	103	3,020	889	9,400	272	160	129	76	51	57
25	96	77	117	2,780	2,170	7,020	3,670	160	122	90	50	57
26	70	75	117	1,730	5,610	2,210	2,820	405	115	273	43	66
27	65	76	110	1,140	6,870	985	1,390	474	102	317	41	60
28	77	90	103	843	5,870	751	860	383	213	232	41	56
29	71	117	103	484	-------	616	568	295	122	361	39	52
30	74	272	96	375	-------	528	1,040	186	90	664	41	51
31	68	-------	103	312	-------	462	-------	152	-------	242	39	-------

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
1928					
July 21–31	156	78	102	0.182	0.07
August	843	47	139	.248	.29
September	935	49	117	.209	.23
1928–29					
October	132	43	63.3	.113	.13
November	272	67	93.8	.168	.19
December	528	84	147	.262	.30
January	3,020	110	597	1.07	1.23
February	6,870	172	1,210	2.16	2.25
March	9,400	440	2,210	3.95	4.55
April	3,670	234	774	1.38	1.54
May	4,020	152	718	1.28	1.48
June	1,010	72	165	.295	.33
July	1,540	76	265	.473	.55
August	935	39	166	.296	.34
September	2,500	39	239	.427	.48
The year	9,400	39	551	.984	13.37

• Interpolated.

Digitized by Google

COLDWATER RIVER NEAR COLDWATER, MISS.

LOCATION.—Chain gage in T. 4 S., R. 7 W. Chickasaw meridian, at highway bridge on United States Route 51, 1¼ miles northwest of Coldwater and 1½ miles below Beartail Creek.

DRAINAGE AREA.—617 square miles.

RECORDS AVAILABLE.—July, 1928, to September, 1929.

EXTREMES.—Maximum discharge during period, 20,000 second-feet Feb. 27 (gage height, 15.89 feet); minimum, 69 second-feet Sept. 30, 1929; minimum gage height, 2.36 feet Aug. 21, 1929.

REMARKS.—Records fair. The Vicksburg office of United States Army Engineers furnished part of field data, and computations were made in conjunction with it.

Daily discharge, in second-feet, 1928–29

Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.
1928				1928				1928			
1	-------	98	229	11	-------	93	84	21	-------	132	74
2	-------	97	452	12	-------	91	89	22	-------	753	90
3	-------	95	245	13	-------	91	87	23	-------	269	93
4	-------	101	127	14	-------	89	90	24	138	189	91
5	-------	95	123	15	-------	82	91	25	142	202	90
6	-------	89	114	16	-------	87	74	26	110	161	89
7	-------	97	103	17	-------	85	77	27	170	130	87
8	-------	91	94	18	-------	91	82	28	122	112	88
9	-------	92	80	19	-------	107	87	29	110	110	86
10	-------	92	85	20	-------	133	85	30	110	108	85
								31	101	130	-------

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1928-29												
1	87	78	1,640	168	295	4,220	638	688	169	128	156	84
2	88	154	1,820	197	240	2,710	580	1,260	116	128	127	85
3	90	566	1,600	223	215	1,060	312	2,770	169	126	111	83
4	82	367	990	190	168	1,280	265	1,000	205	122	105	76
5	84	189	646	180	195	1,950	228	897	237	122	109	146
6	84	156	231	307	201	3,270	196	660	126	136	105	704
7	87	120	175	790	180	2,410	156	353	127	138	107	353
8	93	132	140	530	166	1,900	150	657	187	138	105	144
9	91	116	132	370	168	1,360	2,060	962	1,250	136	101	157
10	91	98	126	939	368	1,120	6,010	2,050	1,060	182	432	99
11	88	118	126	1,300	402	951	5,150	2,800	329	165	234	96
12	88	108	128	1,000	228	666	4,060	1,250	225	128	139	104
13	100	102	187	662	177	730	1,520	922	157	144	130	1,020
14	93	101	337	292	156	1,980	1,430	415	146	128	119	1,080
15	91	99	886	202	172	2,560	1,720	957	148	140	112	598
16	92	96	438	176	422	3,040	4,730	1,140	155	130	100	195
17	822	101	604	205	382	3,190	2,290	809	148	307	101	153
18	1,170	99	1,280	210	451	2,530	1,560	495	128	1,540	101	99
19	761	116	1,640	1,260	295	905	1,400	436	140	3,150	89	91
20	400	106	1,920	1,900	268	536	750	289	146	2,000	81	84
21	232	103	844	4,910	524	417	588	207	130	738	73	79
22	199	96	415	1,160	1,280	658	479	151	130	242	76	81
23	460	97	326	779	1,490	2,180	334	136	129	148	85	83
24	396	103	177	642	1,540	3,040	220	124	138	128	91	84
25	250	102	144	1,540	1,260	3,270	385	130	167	110	97	87
26	251	102	126	1,030	7,650	2,980	1,100	798	231	112	98	97
27	181	126	151	1,080	20,000	2,620	724	1,090	197	111	93	95
28	146	136	142	2,100	14,600	1,090	520	1,170	183	117	91	96
29	136	650	126	1,030	-------	567	307	1,310	189	108	88	87
30	116	1,370	122	738	-------	980	271	962	136	105	85	69
31	122	-------	130	373	-------	951	-------	375	-------	112	86	-------

Digitized by Google

Monthly discharge of Coldwater River near Coldwater, Miss., 1928–29

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
1928					
July 24–31	170	101	125	0.208	0.06
August	753	82	135	.219	.25
September	452	74	112	.182	.20
1928–29					
October	1,170	82	228	.370	.43
November	1,370	78	197	.319	.36
December	1,920	122	573	.929	1.07
January	4,910	168	854	1.38	1.59
February	20,000	156	1,910	3.10	3.23
March	4,220	417	1,840	2.98	3.44
April	6,010	150	1,340	2.17	2.42
May	2,800	124	878	1.42	1.64
June	1,250	116	231	.374	.42
July	3,150	105	362	.587	.68
August	432	73	117	.190	.22
September	1,080	69	210	.340	.38
The year	20,000	69	721	1.17	15.88

YALOBUSHA RIVER AT GRENADA, MISS.

LOCATION.—Chain gage in T. 22 N., R. 5 E. Choctaw meridian, at highway bridge on U. S. Route 51 in Grenada, 1 mile below Batupan River.

DRAINAGE AREA.—1,550 square miles.

RECORDS AVAILABLE.—June to November, 1906; July, 1908, to March, 1912; July, 1928, to September, 1929.

EXTREMES.—Maximum discharge during period, 17,800 second-feet Mar. 25 (gage height 25.42 feet); minimum, 47 second-feet Sept. 6, 1929; minimum gage height, 2.18 feet Oct. 13, 1928.

1906, 1908–1912, 1928–1929: Maximum and minimum discharge, same as above.

REMARKS.—Records fair. The Vicksburg office of United States Army Engineers furnished part of field data, and computations were made in conjunction with it.

Daily and monthly discharge, in second-feet, 1928–29

Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.
1928				1928				1928			
1		224	*740	11		128	99	21	456	75	68
2		508	750	12		120	92	22	337	75	68
3		288	690	13		106	86	23	422	74	63
4		256	580	14		99	80	24	354	422	59
5		208	456	15		98	74	25	371	371	59
6		176	288	16		93	75	26	304	405	58
7		144	208	17		82	92	27	272	256	57
8		144	168	18		78	77	28	337	710	54
9		136	152	19		77	68	29	388	*710	60
10		128	112	20	634	78	67	30	320	*720	*56
								31	256	*730	

Digitized by Google

Daily and monthly discharge, in second-feet, of Yalobusha River at Grenada, Miss., 1928–29—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1928-29												
1	53	64	101	110	354	4,570	2,310	2,600	272	• 713	1,290	52
2	53	73	106	136	288	4,530	1,160	3,340	• 248	490	836	52
3	53	73	109	128	• 264	• 4,080	880	3,520	224	490	• 613	52
4	53	75	102	112	240	3,620	750	3,480	192	320	• 390	51
5	53	77	102	256	224	2,920	710	• 3,070	200	405	168	50
6	54	71	93	• 264	224	2,730	652	2,660	176	405	136	47
7	54	73	87	272	224	2,570	• 589	2,160	176	288	128	50
8	54	74	84	240	208	1,980	526	2,410	634	184	128	74
9	54	73	78	224	224	1,230	526	2,570	• 589	152	176	106
10	57	74	77	439	• 224	• 960	1,050	2,600	544	136	598	104
11	52	73	75	526	224	690	1,650	2,440	354	128	1,130	98
12	53	68	75	526	208	580	1,950	• 1,920	256	112	1,710	168
13	51	64	99	• 391	200	1,340	1,570	1,400	200	99	1,460	320
14	52	63	136	256	192	6,190	• 1,240	928	168	94	750	598
15	54	60	144	184	208	6,370	904	904	144	92	388	526
16	55	60	144	160	405	6,190	1,080	792	• 136	184	256	473
17	55	60	160	136	526	• 7,960	1,230	690	128	1,650	184	730
18	53	71	192	144	562	9,720	1,160	634	120	1,860	144	880
19	53	73	208	288	490	9,280	750	• 571	101	792	104	670
20	58	78	176	354	422	7,570	634	508	94	304	98	388
21	55	81	152	371	2,410	6,010	• 735	598	86	240	93	288
22	60	80	136	354	2,990	7,270	836	544	78	160	90	224
23	80	74	112	320	2,920	15,900	670	456	• 267	136	81	168
24	75	71	101	473	2,790	•16,800	562	354	456	272	70	136
25	74	70	• 110	1,340	2,160	17,800	3,520	320	354	168	67	120
26	73	73	120	1,740	4,170	14,800	3,440	• 337	1,290	304	64	99
27	73	73	112	1,480	4,410	11,800	3,410	354	1,100	288	59	92
28	73	78	99	1,000	4,610	8,620	• 3,000	750	1,180	57	57	101
29	70	80	93	652	------	7,270	2,600	562	1,160	136	54	92
30	66	90	90	508	------	5,920	1,290	371	• 937	422	54	81
31	68	------	90	422	------	• 4,120	------	320	------	1,160	52	------

Month	Discharge in second-feet				Run-off in inches
	Maximum	Minimum	Mean	Per square mile	
1928					
July 20-31	634	256	371	0.239	0.11
August	730	74	249	.161	.19
September	750	54	185	.119	.13
1928-29					
October	80	51	59.4	.038	.04
November	90	60	72.2	.047	.05
December	208	75	115	.074	.09
January	1,740	110	445	.287	.33
February	4,610	192	1,160	.748	.78
March	17,800	580	6,500	4.19	4.83
April	3,520	526	1,380	.890	.99
May	3,520	320	1,420	.916	1.06
June	1,290	78	395	.255	.28
July	1,860	57	395	.255	.29
August	1,710	52	369	.238	.27
September	880	47	230	.148	.17
The year	17,800	47	1,050	.677	9.18

• Interpolated.

Digitized by Google

RED RIVER BASIN

RED RIVER NEAR DENISON, TEX.

LOCATION.—Chain gage on Denison-Colbert toll bridge, half a mile below Missouri-Kansas-Texas Railroad bridge and 4½ miles northeast of Denison, Grayson County.

DRAINAGE AREA.—39,400 square miles.

RECORDS AVAILABLE.—October, 1928, to September, 1929. United States Weather Bureau has obtained readings of stage at Missouri-Kansas-Texas Railroad bridge, half a mile upstream, since January, 1906. Relation between gages not known.

EXTREMES.—Maximum discharge during year, about 113,000 second-feet May 14 (gage height, 15.25 feet); minimum, 314 second-feet Oct. 25.

1923–1929: Maximum discharge, 132,000 second-feet Oct. 17, 1923 (gage height, 19.4 feet); minimum discharge, 314 second-feet Oct. 25, 1928.

REMARKS.—Records fair. No diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	529	1,460	1,560	1,000	1,360	1,460	15,400	2,660	21,000	5,870	1,780	522
2	550	1,360	1,560	960	1,270	1,360	11,600	3,110	23,200	4,760	1,460	480
3	585	1,780	1,460	960	1,270	1,360	8,780	2,660	24,800	3,610	1,270	508
4	585	1,040	1,360	1,040	1,270	1,360	7,760	2,140	21,700	2,950	1,180	452
5	585	880	1,270	1,670	1,270	1,360	7,170	1,900	15,900	2,800	1,180	655
6	550	1,270	1,180	2,520	1,270	1,360	6,890	1,780	11,600	2,800	1,090	920
7	515	2,340	1,140	2,390	1,270	1,270	6,360	1,560	12,000	7,870	1,040	1,460
8	494	2,520	1,090	1,900	1,180	1,270	4,970	1,670	29,200	6,540	920	1,140
9	480	2,260	1,000	2,140	1,140	1,140	4,350	3,240	24,800	5,190	840	7,270
10	473	2,140	1,000	2,140	1,000	1,040	3,970	5,190	15,900	5,870	800	17,200
11	487	1,900	1,000	1,900	1,000	2,610	3,970	3,110	12,000	4,160	800	58,000
12	459	1,670	1,040	1,670	1,140	7,460	4,550	8,150	9,940	2,950	760	52,100
13	438	1,670	1,360	1,460	1,090	5,640	5,640	52,000	7,760	2,660	760	28,200
14	431	1,460	2,140	1,270	1,270	4,970	4,550	97,300	6,360	2,260	760	18,300
15	445	2,480	2,390	1,270	1,180	4,350	2,950	58,000	5,410	1,900	725	14,400
16	431	1,900	2,390	1,180	1,270	3,110	2,800	43,700	4,760	1,900	690	13,400
17	431	1,780	2,260	1,090	1,270	2,950	2,520	31,000	3,970	1,780	725	12,000
18	404	1,460	1,780	1,140	1,270	3,110	2,390	34,100	3,110	1,670	690	10,800
19	386	1,180	1,670	1,140	1,180	2,260	2,260	33,000	2,800	1,460	690	9,940
20	374	2,140	1,900	1,040	1,180	1,780	2,140	36,300	2,800	1,360	690	7,760
21	362	2,140	1,780	1,140	1,270	2,800	2,020	27,300	2,660	1,270	655	5,190
22	362	2,660	1,560	1,140	1,270	2,950	2,020	20,300	2,390	1,270	620	4,160
23	326	4,350	1,460	1,180	1,270	2,260	2,020	13,900	2,520	1,270	655	3,970
24	326	3,610	1,460	2,140	1,180	1,900	3,270	11,600	2,390	5,530	655	3,610
25	320	3,270	1,360	4,040	1,460	1,560	2,950	9,940	2,520	6,620	620	3,270
26	332	3,110	1,270	3,270	1,670	1,460	3,440	9,940	3,610	5,190	690	2,800
27	338	3,270	1,180	2,260	1,560	1,360	3,970	8,780	4,160	4,970	760	2,390
28	438	2,800	1,040	1,670	1,560	1,270	3,970	6,360	4,350	4,550	725	2,260
29	585	2,260	920	1,560	-------	1,460	2,950	7,460	4,970	3,970	620	2,140
30	529	1,900	1,000	1,560	-------	10,900	2,660	9,160	5,640	2,520	585	1,900
31	620	-------	1,000	1,460	-------	24,800	-------	14,400	-------	2,020	550	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	620	320	457	28,100
November	4,350	880	2,140	127,000
December	2,390	920	1,440	88,500
January	4,040	960	1,650	101,000
February	1,670	1,000	1,260	70,000
March	24,800	1,040	3,350	206,000
April	15,400	2,020	4,680	278,000
May	97,300	1,560	18,100	1,110,000
June	29,200	2,390	9,810	584,000
July	7,870	1,270	3,530	217,000
August	1,780	550	838	51,500
September	58,000	452	9,570	569,000
The year	97,300	320	4,750	3,430,000

Digitized by Google

RED RIVER AT GARLAND CITY, ARK.

LOCATION.—Chain gage in SE. ¼ sec. 17, T. 14 S., R. 25 W., on St. Louis Southwestern Railway bridge at Garland City.

RECORDS AVAILABLE.—October, 1927, to September, 1929.

EXTREMES.—Maximum discharge during year, 107,000 second-feet May 25 (gage height, 30.6 feet); minimum discharge, 660 second-feet Sept. 2; minimum gage height, 4.3 feet Oct. 24–29.

1928–29: Maximum discharge, 107,000 second-feet May 25, 1929 (gage height, 30.6 feet); minimum discharge, 660 second-feet Sept. 2, 1929; minimum gage height, 4.3 feet Oct. 24–29, 1928.

Maximum stage known, 35.4 feet April, 1927.

REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,980	1,660	6,380	10,600	50,300	45,200	10,600	6,980	75,500	5,250	6,000	860
2	1,820	1,820	5,620	8,760	44,700	46,200	10,100	6,980	73,300	4,260	6,000	660
3	1,660	3,390	12,300	7,640	37,900	45,200	25,200	6,540	70,000	5,250	5,500	720
4	1,820	4,860	13,800	6,540	32,900	43,700	28,500	7,640	66,200	8,600	5,000	860
5	1,820	7,140	12,700	5,890	26,400	44,700	24,400	8,300	65,100	9,380	4,500	790
6	1,980	7,520	11,100	9,680	21,300	43,200	20,100	7,200	63,000	9,900	3,540	720
7	1,820	7,900	9,300	24,100	16,600	39,800	17,100	6,540	60,300	10,700	2,830	860
8	1,820	7,710	7,710	39,300	14,200	35,600	15,000	6,320	55,000	9,900	2,400	1,030
9	1,820	7,140	6,000	44,700	14,000	30,200	14,200	6,320	49,800	8,600	2,200	1,120
10	1,820	6,380	5,430	43,700	15,800	24,400	13,000	5,890	42,200	7,820	2,020	1,030
11	1,820	5,050	5,240	41,300	20,100	19,800	22,000	7,860	43,200	8,600	1,850	1,450
12	1,820	3,750	4,860	38,900	21,300	17,100	28,100	11,300	45,200	11,500	1,700	1,570
13	1,820	3,210	4,290	36,500	20,700	15,000	32,400	13,800	37,900	12,600	1,700	22,700
14	1,820	2,670	4,670	34,200	18,200	14,000	32,000	19,800	29,800	10,700	1,700	51,900
15	2,320	3,030	10,500	31,100	15,500	14,800	28,500	42,700	23,400	9,380	1,570	57,100
16	2,320	3,750	14,700	26,400	14,300	33,800	24,400	65,100	22,400	8,860	1,450	49,300
17	1,980	3,750	18,600	21,600	14,200	38,900	21,300	74,400	24,400	7,820	1,330	37,400
18	1,820	3,390	31,100	20,700	14,800	37,000	19,400	81,200	24,800	6,260	1,220	26,800
19	1,660	5,240	53,900	15,500	15,000	33,800	16,800	85,800	20,700	5,500	1,220	20,700
20	1,350	6,950	63,000	15,200	15,000	30,700	14,200	90,400	16,700	4,750	1,220	17,100
21	1,350	10,100	67,800	15,000	14,500	25,600	11,600	93,400	14,000	4,020	1,220	16,000
22	1,350	10,700	62,400	15,000	14,000	21,000	9,680	101,000	12,600	3,780	1,120	14,500
23	1,350	10,700	57,600	14,000	14,000	18,200	9,220	103,000	11,200	3,540	1,120	13,500
24	1,200	9,500	52,400	13,500	14,500	17,400	8,080	104,000	9,640	3,300	1,030	13,200
25	1,200	7,900	47,700	13,200	16,000	17,100	7,860	107,000	9,120	3,060	940	12,000
26	1,200	6,760	42,200	38,900	17,100	17,400	8,530	101,000	8,860	2,830	940	9,680
27	1,200	5,620	35,600	52,900	18,800	16,800	8,530	94,600	8,600	2,600	940	9,220
28	1,200	5,240	34,700	60,300	38,900	14,800	7,860	84,600	8,600	2,600	940	7,860
29	1,200	4,860	24,100	59,700	-------	13,000	7,420	78,300	8,860	2,200	940	6,980
30	1,350	6,000	18,200	59,200	-------	11,800	7,200	76,600	5,250	2,200	860	6,540
31	1,350	-------	13,800	55,500	-------	10,600	-------	77,200	-------	5,750	860	-------

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	2,320	1,200	1,650	101,000
November	10,700	1,660	5,790	345,000
December	67,800	4,290	24,400	1,500,000
January	60,300	5,890	28,400	1,750,000
February	50,300	14,000	21,100	1,170,000
March	46,200	10,600	27,000	1,660,000
April	32,400	7,200	16,800	1,000,000
May	107,000	5,890	51,000	3,140,000
June	75,500	5,250	33,500	1,990,000
July	12,600	2,200	6,500	400,000
August	6,000	860	2,120	130,000
September	57,100	660	13,500	803,000
The year	107,000	660	19,300	14,000,000

Digitized by Google

RED RIVER AT SHREVEPORT, LA.

LOCATION.—Chain gage in sec. 30, T. 18 S., R. 13 W., at Shreveport, half a mile below Cross Bayou. Zero of gage is 130.99 feet above mean sea level.

RECORDS AVAILABLE.—July, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 121,000 second-feet May 26–27 (gage height, 27.48 feet); minimum, 1,990 second-feet Oct. 25 (gage height, 3.78 feet).

1928–29: Maximum and minimum discharge, same as given above.

Maximum stages known, 45.9 feet in August, 1849; 37.4 feet Apr. 29 and 30, 1927.

REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,200	2,040	6,300	46,000	63,600	50,800	19,700	16,400	101,000	11,000	4,420	2,120
2	2,140	2,550	6,300	41,600	58,000	53,800	18,700	16,000	97,500	10,400	6,080	2,070
3	2,140	3,540	6,840	38,500	53,800	53,800	18,700	16,000	94,200	11,400	6,960	2,070
4	2,200	3,660	9,960	35,500	50,800	53,800	29,600	15,200	89,800	14,500	6,520	2,020
5	2,200	4,180	14,000	34,000	46,600	54,400	35,500	14,400	83,200	14,800	6,080	2,020
6	2,260	6,660	16,000	34,000	43,200	55,000	31,500	15,000	80,100	14,000	5,480	2,020
7	2,260	8,000	15,000	50,800	39,000	53,200	27,000	14,400	78,300	14,500	5,100	2,020
8	2,200	8,860	12,400	60,100	36,000	50,200	23,900	13,700	74,700	15,400	4,420	2,020
9	2,200	9,080	10,800	62,900	33,500	46,600	21,800	12,800	68,500	15,400	3,980	2,070
10	2,140	9,080	9,520	60,100	32,000	42,700	20,800	12,200	61,500	14,000	3,580	2,070
11	2,140	8,640	8,000	58,700	35,500	39,000	21,100	11,500	57,400	13,000	3,340	2,120
12	2,200	8,200	7,020	56,800	38,000	36,000	27,800	11,500	58,000	12,700	3,120	2,120
13	2,090	7,600	6,840	54,400	38,500	34,500	35,000	13,300	58,000	15,400	3,020	2,510
14	2,140	7,200	7,020	52,000	37,000	32,000	38,000	16,700	50,800	15,700	2,930	8,060
15	2,260	6,840	7,600	49,600	34,500	32,000	36,500	23,200	43,200	15,700	2,930	50,800
16	2,470	6,660	9,740	47,200	31,000	39,000	34,500	53,200	37,000	14,000	2,840	56,200
17	2,800	6,660	16,400	44,400	28,700	51,400	31,000	69,200	34,000	12,700	2,670	49,600
18	2,800	6,840	24,600	41,600	27,800	53,200	27,800	78,300	35,000	11,400	2,670	40,000
19	2,630	6,300	47,800	38,500	27,000	50,800	25,800	85,400	35,500	9,960	2,590	31,500
20	2,550	5,760	65,700	36,500	26,200	47,200	23,200	89,800	31,500	8,520	2,510	25,000
21	2,470	5,940	72,900	35,500	26,200	44,400	22,500	94,200	27,000	7,400	2,440	21,100
22	2,330	7,020	74,700	35,500	26,200	39,500	21,100	99,700	22,800	6,300	2,370	18,700
23	2,200	10,600	72,900	34,500	25,000	35,500	18,700	105,000	20,000	5,880	2,370	17,200
24	2,090	11,500	70,600	34,000	25,800	31,500	17,500	113,000	17,800	5,100	2,300	16,000
25	1,990	11,700	67,100	33,500	26,200	30,000	18,400	117,000	16,000	4,740	2,300	14,500
26	2,040	10,600	66,400	38,500	27,800	29,200	19,400	120,000	14,800	4,420	2,240	13,000
27	2,090	9,080	65,700	60,800	29,600	28,200	19,400	120,000	13,700	4,420	2,240	11,700
28	2,090	7,800	63,600	69,200	37,000	27,000	18,700	115,000	12,700	4,260	2,180	10,200
29	2,040	6,120	60,800	72,900	-------	25,400	18,100	108,000	12,700	3,980	2,180	8,760
30	2,040	5,940	56,200	72,000	-------	23,600	17,500	102,000	12,000	3,840	2,120	7,620
31	1,990	-------	52,600	67,800	-------	21,800	-------	101,000	-------	3,700	2,120	-------

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	2,800	1,990	2,240	138,000
November	11,700	2,040	7,160	426,000
December	74,700	6,300	33,300	2,050,000
January	72,900	33,500	48,300	2,970,000
February	63,600	25,000	35,900	1,990,000
March	55,000	21,800	40,800	2,510,000
April	38,000	17,500	24,600	1,460,000
May	120,000	11,500	57,800	3,550,000
June	101,000	12,000	48,000	2,860,000
July	15,700	3,700	10,300	633,000
August	6,960	2,120	3,420	210,000
September	56,200	2,020	14,200	845,000
The year	120,000	1,990	27,100	19,600,000

Digitized by Google

PEASE RIVER NEAR CROWELL, TEX.

LOCATION.—Chain gage on Quanah-Crowell highway bridge, 1 mile below mouth of Devils Creek and 8 miles north of Crowell, Foard County.
DRAINAGE AREA.—2,940 square miles.
RECORDS AVAILABLE.—January, 1924, to September, 1929.
EXTREMES.—Maximum discharge during year, from slope-area method, 18,600 second-feet May 12 (gage height, 8.88 feet). No flow during several periods.
1924–1929: Maximum discharge not determined; maximum gage height, 9.92 feet Oct. 3, 1926; no flow during several periods.
REMARKS.—Yearly record poor. Daily and monthly records not sufficiently accurate for publication. No diversions. Total yearly discharge, 110,000 acre-feet.

WASHITA RIVER NEAR DURWOOD, OKLA.

LOCATION.—Chain gage in sec. 3, T. 4 S., R. 3 E., 3 miles north of Durwood.
RECORDS AVAILABLE.—August, 1928, to September, 1929.
EXTREMES.—Maximum discharge during period, 15,400 second-feet June 1 (gage height, 26.30 feet); minimum, 204 second-feet Oct. 21 (gage height, 3.32 feet).
Maximum stage known, 38 feet in April and June, 1927.
REMARKS.—Records good. Discharge interpolated Dec. 4, Apr. 9, 10, 12, 13, June 8, July 11, 21, 26, and Aug. 29 to Sept. 3, 1929.

Daily and monthly discharge, in second-feet, 1928–29

Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1928			1928			1928		
1	------	685	11	830	450	21	580	335
2	------	720	12	910	950	22	545	305
3	------	1,030	13	790	990	23	685	315
4	1,350	755	14	790	870	24	1,350	310
5	1,270	510	15	720	790	25	1,560	300
6	1,420	480	16	685	450	26	510	310
7	1,980	450	17	615	422	27	615	310
8	1,910	450	18	580	395	28	685	300
9	1,270	450	19	580	395	29	510	300
10	830	422	20	580	362	30	450	300
						31	720	------

Digitized by Google

Daily and monthly discharge, in second-feet, of Washita River near Durwood, Okla., 1928–29—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1928–29												
1	280	545	650	510	395	510	4,390	1,420	15,400	2,580	340	230
2	280	950	615	510	395	510	3,750	910	13,400	1,910	305	230
3	265	950	580	510	395	510	3,550	830	9,280	1,700	395	230
4	275	910	560	1,420	422	510	3,830	755	5,450	1,630	395	230
5	270	650	545	1,350	422	510	3,550	720	4,470	1,560	370	230
6	265	480	480	1,110	580	480	2,760	650	4,550	1,700	345	230
7	265	422	480	990	580	480	1,840	650	4,110	2,820	325	510
8	265	395	450	870	615	480	1,770	2,050	3,700	2,260	320	1,350
9	260	362	450	790	615	450	2,370	685	3,300	1,350	310	2,260
10	255	356	450	615	580	450	2,960	650	2,820	1,190	310	6,350
11	250	351	450	580	510	450	3,550	650	2,400	1,030	310	6,470
12	245	346	450	615	422	1,350	2,790	12,200	2,190	870	310	5,950
13	245	340	910	580	422	3,100	2,030	14,400	1,770	755	300	5,650
14	245	351	950	580	480	1,700	1,270	12,300	1,560	1,030	300	5,230
15	236	373	1,270	545	545	1,190	1,190	9,140	1,350	950	300	4,790
16	236	545	1,190	580	650	910	1,030	12,200	1,270	910	290	4,510
17	245	685	1,110	580	580	755	870	7,950	1,190	830	290	4,110
18	236	1,910	1,110	580	580	755	790	11,900	1,110	685	290	3,750
19	222	2,260	950	545	545	720	790	7,880	1,030	580	280	2,050
20	218	1,560	755	580	510	1,840	755	5,900	950	580	280	1,770
21	208	1,030	720	545	510	990	755	5,070	870	580	275	1,630
22	222	545	685	580	510	685	790	5,030	830	580	270	1,490
23	213	510	650	580	510	545	1,420	5,070	790	545	260	1,350
24	213	1,030	615	755	510	545	1,560	5,030	1,960	545	250	1,110
25	213	1,560	580	755	450	545	1,560	4,510	2,820	545	240	910
26	213	1,420	545	720	510	510	1,420	3,500	2,940	650	240	870
27	213	910	480	685	510	510	1,270	1,700	3,250	755	240	830
28	218	830	510	545	510	580	1,110	1,910	3,700	650	230	755
29	222	720	615	545	-------	1,770	950	2,120	3,750	545	230	685
30	226	685	580	450	-------	3,950	1,770	3,550	3,700	480	230	650
31	231	-------	545	422	-------	4,710	-------	10,800	--------	422	230	------

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
1928				
August 4–31	1,980	450	904	52,200
September	1,030	300	504	32,100
The period	----------	----------	----------	84,300
1928–29				
October	280	208	240	14,800
November	2,260	340	799	47,500
December	1,270	450	675	41,500
January	1,420	422	678	41,700
February	650	395	509	28,300
March	4,710	450	1,060	65,200
April	4,390	755	1,950	116,000
May	14,400	650	4,910	302,000
June	15,400	790	3,530	210,000
July	2,820	422	1,070	65,800
August	395	230	292	18,000
September	6,470	230	2,210	132,000
The year	15,400	208	1,500	1,080,000

Digitized by Google

KIAMICHI RIVER NEAR BELZONI, OKLA.

LOCATION.—Chain gage at Antlers-Rattan highway bridge, 1¼ miles northwest of Belzoni and 6 miles below mouth of Cedar Creek.

DRAINAGE AREA.—1,420 square miles.

RECORDS AVAILABLE.—December, 1925, to September, 1929.

EXTREMES OF DISCHARGE.—Maximum discharge during year, 32,700 second-feet May 14 (gage height, 36.65 feet); minimum, 0.6 second-foot Sept. 2–4 (gage height, 3.53 feet).

1926–1929: Maximum discharge, 61,400 second-feet (subject to considerable error) Dec. 14, 1927 (gage height, 41.24 feet); minimum, that of Sept. 2–4, 1929.

REMARKS.—Records fair. Small diversion by city of Antlers.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.6	98	2,060	346	1,230	5,210	982	216	2,060	194	12	0.7
2	7.3	439	1,750	292	1,080	3,620	886	959	1,900	172	11	.6
3	7.6	586	934	276	982	2,670	886	982	1,800	1,750	10	.6
4	6.6	440	700	382	982	2,110	886	700	1,690	934	9.4	.6
5	6.6	310	500	9,770	982	1,750	838	460	1,590	346	8.8	5.6
6	5.8	208	400	10,700	1,330	1,490	746	346	2,010	550	8.2	172
7	6.4	177	328	5,920	1,690	1,180	654	310	1,430	1,950	7.9	156
8	6.2	139	292	2,950	1,800	1,030	608	328	1,080	1,590	7.0	219
9	5.6	106	261	2,330	1,330	982	1,030	1,950	886	1,180	5.0	940
10	5.4	87	222	2,840	1,280	886	1,900	4,630	700	792	4.8	3,410
11	6.4	72	210	2,450	1,180	746	1,590	2,170	564	500	4.8	2,390
12	5.4	59	222	1,800	1,180	3,330	1,330	2,390	460	328	4.8	792
13	4.6	57	440	1,380	1,330	8,400	1,130	20,100	654	230	4.6	1,080
14	4.2	45	886	1,180	1,850	6,840	934	31,100	5,600	191	4.0	838
15	4.2	84	1,430	1,130	1,850	3,730	838	26,500	3,290	164	3.8	542
16	5.4	765	4,690	1,080	1,750	2,950	700	22,200	1,080	142	3.6	420
17	5.6	1,280	13,600	982	1,690	2,170	608	7,680	886	117	3.4	328
18	5.4	1,280	13,500	982	1,490	1,750	542	13,700	700	104	3.2	261
19	8.5	959	8,020	1,080	1,330	1,430	460	14,200	542	91	2.8	199
20	8.2	586	3,230	1,080	1,180	1,280	440	11,900	420	64	2.0	156
21	8.5	420	2,060	1,080	1,080	1,850	382	5,380	346	54	2.0	132
22	25	328	1,260	934	1,380	1,850	346	2,280	328	46	2.0	113
23	30	276	1,090	982	1,640	1,430	310	1,590	292	43	1.8	98
24	21	230	886	11,400	1,590	1,180	346	1,180	246	39	1.8	80
25	18	199	792	23,000	4,030	1,080	382	2,200	219	36	1.8	72
26	14	172	631	19,900	7,360	934	261	13,300	182	31	1.6	60
27	14	152	586	10,100	7,290	792	261	22,000	154	28	1.8	50
28	18	146	520	3,290	5,990	746	246	13,300	180	24	1.8	46
29	30	596	460	2,330	-------	934	246	4,630	185	20	1.2	42
30	42	1,280	420	1,900	-------	1,330	227	2,730	190	14	.9	33
31	66	-------	382	1,490	-------	1,280	-------	2,060	-------	14	.7	-------

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	66	4.2	13.2	812
November	1,280	45	386	23,000
December	13,600	210	2,020	124,000
January	23,000	276	4,040	248,000
February	7,360	982	2,070	115,000
March	8,400	746	2,160	133,000
April	1,900	227	700	41,700
May	31,100	216	7,530	463,000
June	5,600	154	1,060	63,100
July	1,950	14	379	23,300
August	12	.7	4.47	275
September	3,410	.6	421	25,100
The year	31,100	.6	1,740	1,260,000

Digitized by Google

LITTLE RIVER NEAR WILTON, ARK.

LOCATION.—Chain gage in NW. ¼ sec. 30, T. 11 S., R. 29 W., 3 miles north of Wilton and 200 feet below Cossatot River.

RECORDS AVAILABLE.—August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 42,400 second-feet Dec. 19 (gage height, 25.51 feet); minimum discharge, 15 second-feet Sept. 1–3; minimum gage height, 1.88 feet Oct. 1.

1928–1929: Maximum discharge, that of Dec. 19, 1929; minimum, that of Sept. 1–3, 1929; minimum gage height, 1.85 feet Sept. 30, 1928.

Maximum stage known, 30.2 feet August, 1915.

REMARKS.—Records fair.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	38	206	7,160	1,540	11,700	32,700	3,410	965	12,200	485	73	16
2	40	760	9,190	1,340	6,120	29,000	3,740	1,840	8,950	485	86	16
3	63	2,580	7,270	1,190	4,400	23,500	4,180	2,560	5,540	800	76	16
4	49	1,980	4,450	1,140	3,850	17,600	3,850	2,240	3,950	1,100	71	17
5	52	1,420	2,980	5,540	3,300	10,400	3,300	2,040	2,880	840	65	18
6	67	1,060	2,280	16,300	3,300	7,270	2,880	1,640	2,240	720	65	22
7	98	842	1,980	24,000	3,410	5,540	2,560	1,340	1,640	600	56	32
8	85	680	1,700	27,000	3,960	4,970	2,350	1,190	1,190	485	53	45
9	59	560	1,420	24,800	7,270	4,290	4,510	1,740	880	640	53	67
10	50	485	1,240	20,400	9,430	3,850	14,400	5,890	760	965	49	132
11	55	396	1,140	17,100	8,590	3,960	20,000	6,920	800	1,540	53	1,540
12	52	354	1,060	13,200	7,270	3,850	17,100	6,000	840	1,060	47	11,000
13	49	305	2,380	9,670	6,120	4,290	14,500	5,320	760	840	49	10,500
14	52	284	8,470	6,700	5,430	9,310	10,800	12,600	1,640	600	44	8,350
15	49	298	13,100	4,860	5,200	13,100	8,350	20,800	5,780	572	42	4,070
16	49	312	12,800	3,850	5,430	14,900	6,700	25,500	6,000	422	34	3,630
17	49	1,320	17,900	3,300	5,320	14,100	4,860	26,200	4,290	274	27	1,740
18	46	2,380	24,800	3,740	5,080	11,300	3,740	26,200	2,350	254	26	1,240
19	43	3,380	41,400	3,960	4,620	7,990	3,080	27,500	1,740	312	25	880
20	121	2,580	37,400	4,510	4,400	5,320	2,660	29,900	1,240	241	24	640
21	106	2,280	30,200	4,620	4,290	4,740	2,350	32,200	1,100	173	24	640
22	88	1,890	25,200	4,290	4,860	6,120	2,040	32,200	922	185	26	600
23	65	1,510	19,700	4,180	5,780	6,350	1,840	27,500	840	110	24	408
24	67	1,240	12,000	7,990	6,810	5,320	1,640	22,700	760	110	22	300
25	78	1,010	6,810	16,900	8,470	4,290	1,640	18,200	720	114	22	248
26	49	842	4,860	25,200	14,900	3,520	2,040	12,000	760	146	22	142
27	44	800	3,740	31,400	23,500	2,660	1,940	9,790	800	137	23	119
28	46	720	2,770	30,200	29,300	2,770	1,640	11,500	800	119	22	161
29	63	640	1,840	27,200	.....	2,560	1,440	14,100	680	98	19	127
30	67	1,100	1,740	24,800	.....	2,660	1,340	14,600	560	98	19	179
31	63	.....	1,740	18,200	.....	3,190	.....	14,000	.....	95	18	.....

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	121	38	61.4	3,780
November	3,380	206	1,140	67,800
December	41,400	1,060	10,000	615,000
January	31,400	1,140	12,600	775,000
February	29,300	3,300	7,580	421,000
March	32,700	2,560	8,760	539,000
April	20,000	1,340	5,160	307,000
May	32,200	965	13,500	830,000
June	12,200	560	2,450	146,000
July	1,540	95	472	29,000
August	86	18	40.6	2,500
September	11,000	16	1,570	93,400
The year	41,400	16	5,280	3,830,000

Digitized by Google

SULPHUR RIVER NEAR DARDEN, TEX.

LOCATION.—Staff gage on St. Louis Southwestern Railway bridge 1 mile south of Darden, Bowie County.

DRAINAGE AREA.—2,750 square miles.

RECORDS AVAILABLE.—October, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, about 46,200 second-feet Dec. 21 (gage height, 30.3 feet); no flow Sept. 2–5.

1924–1929: Maximum discharge, that of Dec. 21, 1928; no flow Sept. 2–5, 1929.

REMARKS.—Records poor. No diversions. Gage-height record furnished by United States Weather Bureau.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.9	577	102	1,170	12,500	5,300	396	514	2,190	72	8.0	0.3
2	.9	1,290	92	579	10,100	10,100	466	396	2,100	67	5.8	0
3	57	1,580	126	334	8,180	13,900	696	255	2,240	198	5.8	0
4	40	1,870	598	436	5,620	12,500	840	180	2,390	715	5.8	0
5	62	2,210	490	1,640	3,760	11,700	1,070	132	2,460	1,270	14	0
6	62	2,370	396	2,460	2,480	9,460	1,010	108	2,240	1,170	14	.9
7	77	2,370	297	2,960	1,850	6,660	859	87	2,060	1,130	14	.9
8	121	2,060	247	4,460	1,170	4,090	732	77	1,980	1,450	8.0	32
9	354	1,790	180	7,580	1,370	3,210	714	187	2,190	1,580	11	215
10	549	1,490	145	17,300	1,490	2,350	644	263	2,500	1,270	8.0	215
11	935	1,270	132	17,300	1,560	1,660	936	417	2,750	973	5.8	201
12	954	897	205	15,300	1,540	1,250	1,740	1,520	2,890	660	5.8	166
13	804	514	1,090	12,500	1,430	1,290	2,150	2,300	2,550	418	5.8	114
14	786	344	1,150	10,500	1,310	1,850	2,370	3,160	1,600	297	4.1	194
15	750	187	1,230	8,780	1,230	2,260	2,280	4,280	781	208	4.1	497
16	556	108	2,060	5,940	1,430	2,750	1,640	5,460	344	120	2.5	1,230
17	239	97	4,280	4,190	1,640	3,160	1,010	10,100	194	102	2.5	1,350
18	108	346	6,480	2,750	1,790	3,060	660	17,300	132	72	2.5	1,150
19	77	1,110	15,300	2,060	1,870	5,460	490	19,500	108	52	2.5	878
20	40	1,170	35,000	1,390	1,740	5,170	418	18,400	87	44	.9	660
21	32	1,070	46,200	992	1,560	4,000	374	17,800	77	36	4.1	454
22	17	732	36,500	660	1,560	2,890	334	18,400	67	28	2.5	297
23	17	442	28,000	628	1,790	2,460	271	18,900	62	24	2.5	187
24	17	279	20,000	821	2,100	2,150	215	17,300	57	24	2.5	126
25	14	201	14,800	2,020	2,580	2,060	385	14,800	52	20	2.5	87
26	11	145	11,700	2,750	3,110	1,810	514	12,100	52	20	2.5	67
27	8.0	120	8,180	4,850	4,000	1,350	570	10,100	52	17	.9	48
28	57	87	6,660	13,900	4,800	859	570	7,350	102	17	.9	36
29	145	87	4,910	20,500	.....	570	556	5,170	132	14	.9	28
30	159	114	3,040	19,500	.....	430	570	3,520	97	11	.3	20
31	108	.....	1,980	16,300	.....	396	.....	2,550	.....	8.0	.3	.....

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	954	0.9	231	14,200
November	2,370	87	898	53,400
December	46,200	92	8,120	499,000
January	20,500	334	6,530	402,000
February	12,500	1,170	3,060	170,000
March	13,900	396	4,070	250,000
April	2,370	215	849	50,500
May	19,500	77	6,860	422,000
June	2,890	52	1,150	68,400
July	1,580	8.0	390	24,000
August	14	.3	4.86	299
September	1,350	0	275	16,400
The year	46,200	0	2,720	1,970,000

Digitized by Google

CYPRESS CREEK NEAR JEFFERSON, TEX.

LOCATION.—Staff gage at Farrell Bridge, on Jefferson-Harlenton highway 8 miles west of Jefferson, Marion County, and 14 miles above mouth of Black Cypress Creek.

DRAINAGE AREA.—848 square miles.

RECORDS AVAILABLE.—July, 1924, to September, 1929.

EXTREMES.—Maximum discharge during year, about 13,200 second-feet Dec. 20 (gage height, 21.4 feet); minimum, 2.6 second-feet Sept. 2–7 (gage height, 0.78 foot).

1924–1929: Maximum discharge, that of Dec. 20, 1928; no flow for several periods.

REMARKS.—Monthly records fair. Records of daily discharge not sufficiently accurate for publication. No diversions.

Monthly discharge, in second-feet, 1928–29

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	464	7.5	194	11,900
November	1,740	324	852	50,700
December	12,900	258	2,870	176,000
January	4,810	505	1,890	116,000
February	2,280	992	1,250	69,400
March	2,400	550	1,540	94,700
April	1,740	451	848	50,500
May	2,480	258	1,300	79,900
June	1,380	100	508	30,200
July	451	23	109	6,700
August	23	2.9	7.96	489
September	78	2.6	21.1	1,260
The year	12,900	2.6	951	688,000

Digitized by Google

BAYOU DORCHEAT NEAR MINDEN, LA.

LOCATION.—Staff gage in T. 19 N., R. 9 W., 3 miles west of Minden.
RECORDS AVAILABLE.—July, 1928, to September, 1929.
EXTREMES.—Maximum discharge during year, 2,910 second-feet Apr. 29 and 30 (gage height, 12.50 feet); minimum, 2 second-feet Oct. 1 and 2 (gage height, 0.80 foot).

1928–29: Maximum discharge, that of Apr. 29 and 30, 1929; minimum, 2 second-feet Sept. 14, 15, 27–30, Oct. 1 and 2, 1928, Aug. 10–12 and Sept. 27–30, 1929 (gage height, 0.80 foot).

REMARKS.—Records good. Discharge estimated Aug. 6–10, 14–31 and Sept. 1–24.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2	30	140	1,480	1,840	1,510	868	2,740	238	22	32	
2	2	39	119	1,280	1,840	1,510	724	2,540	170	22	66	
3	6	48	100	966	1,870	1,510	630	2,410	133	126	42	
4	6	59	91	608	1,870	1,540	542	2,250	105	170	73	
5	24	60	88	700	1,870	1,630	460	2,120	92	119	12	
6	89	55	78	748	1,870	1,630	434	1,960	91	88	10	
7	162	55	66	676	1,840	1,600	369	1,780	86	89	8	
8	154	55	56	748	1,720	1,570	335	1,480	77	96	6	
9	82	53	55	844	1,750	1,630	520	1,200	67	91	4	
10	54	50	53	1,100	1,660	1,690	586	940	61	88	2	
11	39	47	56	1,150	1,450	1,720	404	630	54	96	2	
12	28	43	75	1,170	1,370	1,780	369	480	47	112	2	
13	20	43	254	1,170	1,310	1,990	352	440	42	105	7	10
14	18	40	318	1,210	1,340	2,120	369	369	39	84		
15	16	39	335	1,230	1,370	2,220	564	318	31	73		
16	18	38	440	1,230	1,400	2,280	520	386	30	55		
17	55	35	1,070	1,200	1,420	2,310	440	404	30	54		
18	50	32	1,420	1,200	1,450	2,310	440	404	28	68		
19	39	32	1,280	1,280	1,450	2,280	422	460	22	61		
20	48	32	1,310	1,280	1,450	2,220	370	422	22	48		
21	55	30	1,400	1,280	1,450	2,190	335	369	22	35		
22	54	28	1,540	1,230	1,450	2,190	302	352	22	29	15	
23	45	28	1,600	1,170	1,370	2,220	460	352	22	22		
24	36	25	1,630	1,400	1,310	2,090	868	352	22	18		
25	31	22	1,600	1,570	1,310	1,930	1,400	352	18	18		8
26	27	22	1,570	1,480	1,600	1,750	1,930	352	16	16		4
27	22	22	1,570	1,480	1,600	1,540	2,350	369	20	14		2
28	24	23	1,600	1,600	1,540	1,310	2,740	404	26	12		2
29	22	26	1,660	1,720	-------	1,480	2,910	404	27	10		2
30	25	98	1,600	1,780	-------	1,310	2,880	520	23	27		2
31	25	-------	1,600	1,840	-------	1,020	-------	369	-------	18		------

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	162	2	41.2	2,530
November	98	22	40.3	2,400
December	1,660	53	799	49,100
January	1,840	608	1,220	75,000
February	1,870	1,310	1,560	86,600
March	2,310	1,020	1,810	111,000
April	2,910	302	862	51,300
May	2,740	318	901	55,400
June	238	16	56.1	3,340
July	170	10	60.8	3,740
August	73	2	17.3	1,060
September	----------	2	8.7	518
The year	2,910	2	611	442,000

Digitized by Google

OUACHITA RIVER NEAR HOT SPRINGS, ARK.

LOCATION.—Chain gage in SW. ¼ sec. 29, T. 3 S., R. 19 W., 5 miles south of Hot Springs and 1 mile above Hot Springs Creek. Zero of gage is 304.8 feet above mean sea level.

DRAINAGE AREA.—1,420 square miles.

RECORDS AVAILABLE.—June, 1922, to September, 1929.

EXTREMES.—Maximum discharge during year, 41,600 second-feet Dec. 17 (gage height, 23.25 feet); minimum, 32 second-feet Sept. 3 and 4 (gage height, 4.90 feet).

1922–1929: Maximum discharge, 143,000 second-feet May 16, 1923 (gage height, 43.9 feet); minimum, 32 second-feet Sept. 3 and 4, 1929 (gage height, 4.90 feet).

REMARKS.—Records good. Discharge estimated Oct. 1–9.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		386	4,040	738	2,030	4,580	2,250	4,170	1,920	315	108	86
2		2,800	2,800	630	1,720	3,520	2,580	6,000	1,530	440	103	34
3		1,920	1,920	595	1,530	2,910	2,580	3,910	2,470	775	94	32
4		1,350	1,440	630	1,440	3,520	2,140	2,580	2,360	1,260	89	32
5	60	930	1,170	6,700	1,350	5,350	1,920	2,030	1,920	890	91	36
6		700	1,010	17,800	1,260	3,910	1,620	1,620	1,620	1,090	91	42
7		560	850	8,450	1,260	3,150	1,440	1,350	1,350	529	96	47
8		440	775	4,300	1,530	2,580	1,350	1,620	1,620	469	114	54
9		386	665	4,170	1,920	2,360	6,520	11,200	1,170	970	386	96
10	76	338	595	5,350	2,030	1,920	16,700	8,240	890	930	228	108
11	76	284	529	4,880	2,030	1,720	9,570	4,880	665	595	195	275
12	76	267	738	3,780	1,920	1,620	3,520	3,520	440	498	195	2,690
13	72	239	8,240	2,910	1,920	1,720	2,580	8,670	630	413	155	1,530
14	67	228	12,100	2,360	1,920	2,470	2,470	22,800	440	338	119	812
15	69	279	8,030	2,360	2,580	2,580	3,270	11,600	440	315	89	700
16	71	338	5,350	2,470	2,910	3,780	2,580	5,350	595	267	80	595
17	94	1,350	41,200	2,580	2,910	3,030	2,030	3,780	630	208	72	469
18	114	2,910	28,300	8,030	2,800	2,580	1,820	3,270	469	214	65	386
19	292	2,250	9,800	10,300	2,690	2,140	1,530	6,000	386	214	62	315
20	250	1,720	5,180	5,030	3,030	1,920	1,350	6,880	338	176	58	250
21	198	1,260	3,910	3,390	3,270	2,140	1,170	4,170	315	152	55	221
22	176	1,010	2,690	3,030	3,150	2,800	1,090	3,270	292	144	55	198
23	146	812	2,250	2,690	3,780	2,690	970	2,800	738	135	52	176
24	135	665	1,920	5,350	4,440	2,250	1,010	2,470	850	152	50	158
25	124	595	1,620	25,300	7,830	1,820	2,140	2,250	1,440	146	47	141
26	106	529	1,350	19,700	22,500	1,720	1,920	1,530	850	114	45	130
27	103	560	1,170	8,030	18,000	1,720	1,530	1,090	700	135	44	119
28	103	440	1,090	4,580	6,700	1,720	1,260	1,530	529	141	42	114
29	119	440	970	3,390	-------	2,030	1,010	1,530	413	132	42	114
30	146	1,170	850	2,800	-------	2,030	1,440	3,390	362	127	38	103
31	173	-------	812	2,360	-------	2,140	-------	3,030	-------	124	37	-------

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	292	----------	107	6,580
November	2,910	228	905	53,900
December	41,200	529	4,950	304,000
January	25,300	595	5,630	346,000
February	22,500	1,260	3,940	219,000
March	5,350	1,620	2,590	159,000
April	16,700	970	2,780	165,000
May	22,800	1,090	4,730	291,000
June	2,470	292	946	56,300
July	1,260	114	400	24,600
August	386	37	96.7	5,950
September	2,690	32	334	19,900
The year	41,200	32	2,380	1,650,000

Digitized by Google

OUACHITA RIVER AT REMMEL DAM, NEAR MALVERN, ARK.

LOCATION.—Water-stage recorder in SW. ¼ NW. ¼ sec. 36, T. 3 S., R. 18 W., 700 feet below Remmel Dam, 9 miles northwest of Malvern. Zero of gage is 247.94 feet above mean sea level.

DRAINAGE AREA.—1,540 square miles.

RECORDS AVAILABLE.—January, 1925, to September, 1929.

EXTREMES.—Maximum discharge during year, 48,100 second-feet Dec. 17 (gage height, 21.72 feet); minimum, 27 second-feet Nov. 30 and Aug. 25–27 (gage height, 1.70 feet).

1925–1929: Maximum discharge, from extended curve, 138,000 second-feet Apr. 21, 1927 (gage height, 35.7 feet); minimum, 15 second-feet Sept. 12 and 13, 1925 (gage height, 1.52 feet).

Maximum stage known, 36.3 feet May 16, 1923 (discharge, from extended curve, 140,000 second-feet).

REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	124	940	1,520	170	2,940	5,590	2,760	2,750	2,840	2,100	110	93
2	127	1,500	2,210	522	2,850	4,140	2,590	6,910	2,000	750	131	94
3	116	2,480	2,500	1,210	1,210	3,600	2,700	4,660	2,130	627	122	93
4	133	1,050	2,530	1,430	1,690	5,690	2,800	3,300	2,750	441	125	107
5	211	587	1,910	2,560	2,370	6,360	2,650	2,390	2,810	928	116	122
6	154	882	1,140	15,600	2,190	5,060	2,040	2,610	2,310	1,520	102	90
7	163	1,190	1,260	9,880	1,680	3,880	1,310	2,780	1,320	399	106	124
8	149	475	1,560	5,180	1,810	3,400	1,790	2,360	1,290	818	96	113
9	287	819	172	5,060	2,350	2,730	3,900	8,900	1,270	761	92	107
10	149	301	621	6,040	1,960	2,210	14,500	9,190	1,320	949	97	94
11	131	133	1,520	5,880	2,100	2,550	6,470	5,650	1,090	710	113	102
12	135	198	1,820	4,170	2,310	2,800	4,060	4,440	1,200	630	118	98
13	118	152	6,110	3,250	1,930	2,750	3,250	8,110	1,250	478	104	920
14	121	374	12,100	2,990	1,950	2,580	2,590	24,800	1,120	676	114	285
15	267	346	6,840	2,910	2,850	2,900	3,710	14,000	696	470	107	293
16	141	857	10,200	2,850	2,840	2,760	3,010	6,940	173	371	110	970
17	135	523	41,600	2,880	2,370	2,350	2,790	4,460	652	167	109	474
18	146	437	29,600	8,160	2,640	2,740	2,810	3,910	605	135	179	314
19	140	2,230	12,000	12,600	2,850	2,760	2,850	6,040	420	484	117	281
20	196	2,260	6,580	6,090	3,260	2,690	2,850	7,340	455	112	108	351
21	143	2,140	3,830	4,390	3,700	2,720	1,530	3,200	117	113	107	406
22	138	1,680	3,450	3,450	3,660	2,760	204	2,900	39	125	105	300
23	163	948	2,810	3,190	4,020	2,770	902	2,810	372	128	106	249
24	178	996	2,710	6,070	5,230	2,350	1,580	2,750	200	129	102	170
25	173	568	1,550	24,100	8,900	2,580	2,830	2,770	1,760	131	236	154
26	223	225	1,890	20,800	22,300	2,750	2,260	1,790	1,070	163	96	437
27	154	379	2,410	8,280	21,400	2,570	1,030	1,400	711	142	96	201
28	131	1,090	2,340	5,440	8,140	1,450	843	456	574	150	105	324
29	133	1,270	1,950	3,950	-------	2,230	1,310	864	532	126	102	271
30	133	444	366	3,280	-------	2,380	1,740	2,160	534	192	103	228
31	143	-------	1,140	2,960	-------	2,050	-------	2,830	-------	143	93	------

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	287	116	157	9,650
November	2,480	133	916	54,500
December	41,600	172	5,430	334,000
January	24,100	170	5,980	368,000
February	22,300	1,210	4,410	245,000
March	6,360	1,450	3,100	191,000
April	14,500	204	2,860	170,000
May	24,800	456	5,020	309,000
June	2,840	39	1,120	66,600
July	2,100	112	486	29,900
August	236	92	114	7,010
September	970	90	262	15,600
The year	41,600	39	2,480	1,800,000

Digitized by Google

OUACHITA RIVER AT ARKADELPHIA, ARK.

LOCATION.—Chain gage on line between secs. 16 and 21, T. 7 S., R. 19 W., at Arkadelphia, 8 miles below Caddo River. Zero of gage is 164.9 feet above mean sea level.

DRAINAGE AREA.—2,350 square miles.

RECORDS AVAILABLE.—April to September, 1929.

EXTREMES.—Maximum discharge during period, 26,600 second-feet May 15 (gage height, 14.11 feet); minimum, 95 second-feet July 24 (gage height, −0.34 foot).

Maximum stage known, 23.9 feet Apr. 21, 1927.

REMARKS.—Records good except those for extremely high stages, which are fair.

Daily and monthly discharge, in second-feet, 1929

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1			5,510	4,120	900	226	117
2			6,510	3,560	505	209	117
3			7,210	2,900	788	198	108
4			5,350	3,980	1,290	220	112
5			3,980	4,120	788	154	123
6			3,290	3,840	1,630	176	117
7			3,560	2,420	1,540	165	149
8			3,560	2,000	575	154	214
9			8,860	2,000	862	209	575
10			12,600	2,000	1,720	165	360
11			10,000	1,810	1,290	165	372
12			6,510	1,460	1,050	170	575
13			7,930	5,670	575	176	900
14			20,000	4,120	610	214	1,380
15			25,300	2,510	900	144	1,210
16		4,120	13,000	1,380	405	154	296
17		3,420	7,030	750	405	154	298
18		3,420	5,830	1,130	322	165	340
19		3,290	5,030	1,050	238	165	280
20		3,420	9,430	680	575	182	238
21		3,030	5,190	680	214	165	256
22		1,460	3,840	575	176	154	250
23		715	3,560	470	170	149	198
24		1,630	3,560	680	128	154	160
25		4,870	3,420	470	144	154	238
26		4,270	3,160	2,000	154	149	256
27		2,540	2,100	1,630	182	170	262
28	2,120	1,900	2,660	1,380	198	176	262
29		1,540	2,000	938	192	182	220
30		2,310	5,350	470	209	106	316
31			5,030		192	133	

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
April 16–30	4,870	715	2,800	83,300
May	25,300	2,000	6,790	418,000
June	5,670	470	2,020	120,000
July	1,720	128	611	37,600
August	226	106	170	10,500
September	1,380	106	343	20,400
The period				690,000

Digitized by Google

OUACHITA RIVER NEAR CAMDEN, ARK.

LOCATION.—Staff gage in E. ½ sec. 10, T. 13 S., R. 17 W., 2 miles north of Camden, 5 miles below Ecore Fabre Creek, and 20 miles below Little Missouti River.

DRAINAGE AREA.—5,390 square miles.

RECORDS AVAILABLE.—August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 62,400 second-feet Dec. 22; minimum, 150 second-feet Sept. 4 (gage height, −0.12 foot).

1928–29: Maximum discharge, that of Dec. 22, 1928; minimum, that of Sept. 4, 1929.

REMARKS.—Records good. Discharge estimated Dec. 17–27, Jan. 8, 9, 11–15, 20–31, Feb. 27, 28, Mar. 1–4, 6–25, and May 16–18; interpolated Nov. 12, Dec. 16, 28, 29, Jan. 10, and Feb. 1.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	270	378	1,880	5,820	22,000	27,200	5,540	3,920	7,940	1,140	310	175
2	270	585	2,540	4,840	17,500	29,200	5,400	4,980	8,420	940	355	175
3	270	1,770	3,020	3,790	13,100	22,600	5,680	6,480	8,020	750	325	170
4	270	3,400	3,660	3,020	10,900	20,800	5,400	7,860	7,220	750	310	160
5	270	3,980	3,660	3,790	9,060	22,800	4,980	7,000	6,030	1,440	268	172
6	270	3,020	3 400	6, 00	7,620	24,700	4,840	5,610	4,910	1,550	255	182
7	285	1,720	3,080	11,100	6,780	26,100	4,640	4,380	4,570	1,770	242	180
8	360	1,720	2, 30	20,000	7,150	20,200	3,660	4,240	3,790	1,000	242	182
9	378	1,660	2,040	22,000	7,460	22,900	3,660	4,310	3,270	1, 40	242	190
10	412	,550	1, .70	20,100	8,740	21,000	3,920	6,700	2,660	990	242	.68
11	745	1 040	1,440	18,200	10,300	1 ,900	7,150	10,000	2,720	1,340	242	570
12	315	900	1,290	20,000	10,800	11,300	11,100	11,800	2,480	1,240	222	570
13	300	765	1,990	18,000	10,200	10,200	9,220	10,300	2,380	1,140	205	570
14	270	585	5,540	13,100	9,220	9,400	7,620	9,620	2,960	1,140	200	615
15	245	545	7,860	11,700	8,340	9,100	5,890	12,000	6,400	1,140	192	795
16	245	545	11,700	9,620	7,940	9,000	5,120	17,900	6,180	1,140	190	1,090
17	285	545	16,400	8,660	9,700	8,900	5,330	20,700	5,260	990	202	750
18	330	1,290	20,300	8,100	9,940	8,500	4,910	20,400	3,200	890	195	750
19	330	2,260	27,800	8,500	9,300	7,800	4,570	14,300	2,380	750	180	990
20	300	2,960	36,400	14,800	8,580	7,300	3,790	11,900	2,100	570	182	615
21	300	3,460	58,500	21,100	8,500	6,800	3,790	10,700	1,770	548	168	388
22	315	3,400	61,600	20,400	8,980	6,500	4,180	10,000	1,240	660	182	425
23	330	2,960	45,400	15,800	9,700	6,100	3,790	7,380	1,290	405	182	425
24	330	2,320	20,800	17,700	10,600	6,000	2,660	5,610	1,140	355	182	425
25	315	1,990	14,900	20,400	11,500	5,800	3,140	4,700	1,090	340	180	370
26	300	1,660	11,100	23,000	13,100	5,540	5,960	4,440	1,140	340	182	355
27	330	1,600	9,100	27,400	21,400	5,400	8,100	4,240	1,880	325	175	325
28	345	1,550	8,900	32,600	25,500	5,400	7,380	3,920	1,990	310	170	280
29	378	1,550	8,700	38,400	-------	5,120	5,890	3,460	1,500	325	175	325
30	360	1,440	8,500	34,700	-------	4,840	4,310	3,530	1,340	310	172	310
31	330	-------	7,000	26,400	-------	5,400	-------	6,100	-------	340	170	------

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	412	245	311	19,100
November	3,980	378	1,770	105,000
December	61,600	1,290	13,300	818,000
January	38,400	3,020	16,400	1,010,000
February	25,500	6,780	11,200	622,000
March	29,200	4,840	13,100	806,000
April	11,100	2,660	5,390	321,000
May	20,700	3,460	8,340	513,000
June	8,420	1,090	3,580	213,000
July	1,770	310	860	52,900
August	355	168	217	13,300
September	1,090	160	427	25,400
The year	61,600	160	6,240	4,520,000

Digitized by Google

LITTLE MISSOURI RIVER NEAR MURFREESBORO, ARK.

LOCATION.—Chain gage in SE. ¼ sec. 13, T. 8 S., R. 26 W., 2 miles southwest of Murfreesboro and 1 mile below Muddy Creek. Zero of gage is 323.70 feet above mean sea level.

DRAINAGE AREA.—380 square miles.

RECORDS AVAILABLE.—October, 1927, to September, 1929.

EXTREMES.—Maximum discharge during year, 21,600 second-feet Dec. 17 (gage height, 12.52 feet); minimum, 5 second-feet Aug. 30 to Sept. 3 (gage height) 1.68 feet).

1928–29: Maximum and minimum discharge, same as given above.

REMARKS.—Records fair. Discharge interpolated for Sundays, when gage was not read. Discharge estimated Mar. 10–13.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5	328	835	182	525	1,080	750	980	1,190	43	33	5
2	8	835	630	187	490	790	525	835	910	63	24	5
3	15	340	425	215	458	1,020	490	595	630	630	15	5
4	12	230	351	243	425	1,240	458	490	595	363	14	5
5	15	120	269	10,000	388	980	413	415	490	253	12	6
6	11	92	229	5,740	525	750	357	340	670	205	11	8
7	10	73	200	1,480	425	630	342	284	490	150	9	7
8	9	59	160	1,080	790	560	328	263	375	89	9	50
9	10	51	148	1,670	1,300	1,190	4,320	2,080	309	89	12	215
10	11	36	136	2,080	1,070	900	1,540	1,300	243	63	12	295
11	8	31	108	1,420	835	600	930	930	234	63	14	630
12	9	26	160	1,030	710	650	670	4,210	136	43	17	305
13	11	33	6,290	850	670	700	560	7,490	6,770	43	15	187
14	10	36	2,220	670	595	790	560	3,920	1,240	43	15	215
15	9	200	1,190	670	710	1,480	560	2,080	750	43	11	150
16	9	880	11,400	790	710	1,080	458	1,800	556	26	8	95
17	9	1,540	21,600	750	640	895	400	1,190	363	26	8	68
18	10	1,080	3,920	2,370	560	710	328	1,140	305	26	8	51
19	47	630	2,080	2,370	595	630	289	945	205	26	7	43
20	40	34	1,420	1,780	790	560	284	750	120	15	6	33
21	32	328	1,030	1,190	835	710	279	560	160	15	7	29
22	24	243	790	1,080	930	930	274	490	205	15	7	26
23	19	169	670	1,190	1,420	750	224	375	182	15	7	22
24	12	160	560	2,840	3,180	638	295	340	160	15	6	19
25	11	130	490	4,940	4,940	525	1,030	305	120	43	6	17
26	11	101	425	2,370	3,540	458	104	415	89	43	6	15
27	15	108	382	1,780	2,080	710	51	525	89	26	6	14
28	29	108	328	1,190	1,420	560	207	1,800	63	24	5	14
29	43	169	305	880	-------	710	363	1,140	63	15	5	13
30	33	1,540	274	750	-------	525	305	3,540	53	15	5	12
31	101	-------	243	630	-------	458	-------	1,800	-------	15	5	-------

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	101	5	19.3	1,190
November	1,540	26	324	19,300
December	21,600	108	1,910	117,000
January	10,000	182	1,760	108,000
February	4,940	388	1,130	62,800
March	1,480	458	781	48,000
April	4,320	51	590	35,100
May	7,490	305	1,400	86,100
June	6,770	53	592	35,200
July	630	15	82.0	5,040
August	33	5	10.5	646
September	630	5	85.3	5,080
The year	21,600	5	723	523,000

Digitized by Google

SALINE RIVER NEAR WARREN, ARK.

LOCATION.—Chain gage in SW. ¼ sec. 15, T. 13 S., R. 9 W., 3½ miles southeast of Warren and 3 miles below Cypress Creek.
DRAINAGE AREA.—2,490 square miles.
RECORDS AVAILABLE.—August, 1928, to September, 1929.
EXTREMES.—Maximum discharge during year, 11,900 second-feet Mar. 12 (gage height, 20.22 feet); minimum, 18 second-feet Sept. 23–26 (gage height, 1.38 feet).
1928–1929: Maximum and minimum discharge, same as given above. Maximum stage known, 28.0 feet Apr. 27, 1927.
REMARKS.—Records good.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45	88	480	4,910	8,660	8,770	1,960	3,200	1,140	220	64	27
2	63	130	690	2,370	8,660	8,000	2,010	2,550	1,220	220	72	25
3	83	240	620	1,460	8,770	7,400	2,240	1,960	1,420	182	94	24
4	77	255	550	1,260	8,770	7,600	2,420	2,010	1,540	168	81	21
5	115	270	480	1,340	8,440	8,440	2,460	2,320	1,380	250	72	23
6	330	345	410	1,740	7,700	9,580	2,370	2,550	1,100	327	57	26
7	240	585	375	1,830	6,470	10,300	2,140	2,730	830	182	49	24
8	118	655	315	1,880	4,580	10,800	1,780	2,910	830	160	49	74
9	99	585	300	2,190	3,350	11,300	1,540	3,000	795	145	49	115
10	109	392	315	2,910	3,300	11,700	1,540	3,150	725	140	90	60
11	109	345	315	3,500	3,450	11,900	1,540	3,100	655	235	63	39
12	90	315	315	3,600	3,550	11,900	1,380	2,860	655	205	55	33
13	80	285	1,060	3,600	3,550	11,900	1,540	2,640	690	150	49	28
14	64	240	2,550	3,550	3,500	11,700	1,780	2,780	655	140	42	24
15	67	212	2,370	3,550	3,450	11,300	1,920	3,000	585	170	38	22
16	104	200	1,920	3,500	3,600	10,300	1,880	3,300	795	150	36	22
17	795	188	3,000	3,450	3,650	9,100	1,620	3,450	1,180	136	36	20
18	1,960	141	5,270	3,400	3,600	7,600	1,420	3,600	1,220	117	36	20
19	1,500	143	5,870	3,550	3,550	6,640	1,420	3,750	865	100	36	20
20	900	132	5,870	3,650	3,550	4,740	1,540	3,900	550	89	34	20
21	620	132	5,660	3,400	3,600	3,600	1,740	4,000	410	73	34	20
22	360	130	5,520	3,250	4,300	3,200	1,580	4,150	343	67	34	20
23	255	106	5,660	3,500	4,410	3,050	1,340	4,250	280	64	34	18
24	146	97	6,470	4,360	4,300	3,100	1,180	4,360	265	67	31	18
25	124	88	7,800	6,550	4,360	2,460	1,460	4,250	250	64	31	18
26	120	80	9,100	8,220	6,730	2,280	2,780	3,700	205	60	31	18
27	111	74	10,100	8,880	8,770	2,100	3,300	2,280	205	57	31	19
28	99	80	10,600	9,220	9,340	1,920	3,500	1,140	205	49	31	23
29	90	118	10,600	9,220	-------	1,780	3,600	900	250	45	31	24
30	90	143	9,700	8,990	-------	1,880	3,550	980	250	57	29	25
31	86	-------	7,800	8,660	-------	1,960	-------	1,060	-------	64	29	-------

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,960	45	292	18,000
November	655	74	226	13,400
December	10,600	300	3,940	242,000
January	9,220	1,260	4,240	261,000
February	9,340	3,300	5,360	298,000
March	11,900	1,780	7,040	433,000
April	3,600	1,180	2,020	120,000
May	4,360	900	2,900	178,000
June	1,540	205	716	42,600
July	327	45	134	8,240
August	94	29	46.7	2,870
September	115	18	29.0	1,730
The year	11,900	18	2,240	1,620,000

Digitized by Google

BAYOU BARTHOLOMEW NEAR BEEKMAN, LA.

LOCATION.—Chain gage in T. 22 N., R. 6 E., 4 miles south of Beekman and 4 miles above Cypress River. Zero of gage is 70.37 feet above mean sea level.
RECORDS AVAILABLE.—August, 1928, to September, 1929.
EXTREMES.—Maximum discharge during year, 5,230 second-feet Mar. 27 (gage height, 19.20 feet); minimum, 145 second-feet Aug. 30 (gage height, 1.44 feet).
1928–29: Maximum and minimum discharge, same as given above.
REMARKS.—Records good, except those for estimated periods, which are fair. Discharge estimated June 30, July 1–24, Aug. 18–24, and Sept. 8–30.

Daily and monthly discharge, in second-feet, 1928-29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	197	165	209	980	1,060	2,900	4,190	3,010	493		195	154
2	197	197	209	1,000	1,060	3,190	3,830	3,010	493		195	154
3	186	197	209	1,020	1,040	3,350	3,430	3,120	476		195	154
4	186	186	221	1,040	1,060	3,390	3,230	3,390	428		195	163
5	186	197	245	1,060	1,080	3,430	2,980	3,350	412		195	154
6	186	197	245	1,060	1,140	3,390	2,760	3,120	380		184	154
7	186	197	233	1,060	1,160	3,390	2,730	2,870	348		184	163
8	175	197	221	1,060	1,240	3,430	2,380	2,480	259		173	175
9	186	186	221	1,060	1,320	3,510	2,240	2,200	232		173	200
10	175	175	209	1,040	1,420	3,950	2,170	1,740	232		163	200
11	175	186	221	1,020	1,540	3,550	2,040	1,320	232		154	
12	175	197	496	980	1,600	3,630	1,950	1,240	232		154	
13	165	197	595	960	1,620	3,790	1,890	1,080	232	200	154	
14	165	197	578	940	1,650	3,830	1,800	980	232		154	
15	165	197	612	900	1,620	3,910	1,740	842	232		154	
16	175	209	698	860	1,600	3,990	1,710	824	232		163	
17	175	209	842	770	1,600	4,030	1,680	788	232		163	
18	175	209	940	752	1,570	4,030	1,470	752	245		160	
19	175	221	980	960	1,520	3,950	1,470	734	232		160	
20	175	221	1,000	1,040	1,500	3,830	1,370	680	232		160	
21	165	221	1,060	1,060	1,520	3,790	1,300	680	245		154	160
22	165	233	1,080	1,040	1,600	3,870	1,340	680	245		154	
23	165	233	1,060	1,040	1,650	4,430	1,500	698	245		154	
24	165	233	1,040	1,020	1,710	4,470	1,710	680	232		154	
25	165	221	980	1,020	1,800	4,830	2,420	646	232	184	154	
26	165	221	960	1,060	2,240	5,110	2,760	612	232	195	154	
27	165	221	940	1,100	2,520	5,230	2,840	595	219	184	145	
28	175	209	920	1,140	2,660	4,990	3,010	578	219	184	154	
29	175	209	940	1,160	-------	4,750	2,870	561	207	163	154	
30	175	209	940	1,160	-------	4,470	2,900	527	207	173	145	
31	165	-------	960	1,120	-------	4,270	-------	493	-------	184	154	-------

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	197	165	175	10,800
November	233	165	205	12,200
December	1,080	209	647	39,800
January	1,160	752	1,020	62,700
February	2,660	1,040	1,540	85,500
March	5,230	2,900	3,960	243,000
April	4,190	1,300	2,320	138,000
May	3,390	493	1,430	87,900
June	493	207	279	16,600
July	-------	163	196	12,100
August	195	145	165	10,100
September	-------	-------	162	9,640
The year	5,230	-------	1,010	728,000

Digitized by Google

MISCELLANEOUS DISCHARGE MEASUREMENTS

Discharge measurements of streams in the lower Mississippi River Basin at points other than regular gaging stations are listed in the following table:

Miscellaneous discharge measurements in the lower Mississippi River drainage basin during the year ending September 30, 1929

Date	Stream	Tributary to—	Locality	Gage height	Discharge
				Feet	*Sec.-ft.*
Sept. 28	Dry Fork	Meramec River	In sec. 33, T. 38 N., R. 6 W., 3 miles southeast of St. James, Mo.		1.3
Sept. 4	Huzzah Creek	do	William Waller Ford, 1 mile east of Davisville, Mo.		18
July 12	Middle Fork of Obion River.	Obion River	Near Dresden, Tenn	2.32	115
July 30	do	do	do	2.09	60
Sept. 21	do	do	do	2.15	58
Sept. 28	do	do	do	2.26	83
Oct. 16	St. Francis River	Mississippi River	Marked Tree, Ark	2.60	719
Jan. 11	do	do	do	9.46	1,960
June 25	do	do	do	7.38	1,860
Aug. 22	do	do	do	3.66	989
Oct. 23	Blue Spring	James River	In sec. 32, T. 28 N., R. 22 W., 3 miles southeast of Battlefield, Mo.		3.3
Aug. 24	Eleven Point River	Spring River	Birdell, Ark		830
June 26	Strawberry River	Black River	Jesup, Ark		361
Aug. 16	Mulberry River	Arkansas River	Mulberry, Ark	.95	15.5
Do	do	do	do	.95	16.0
Sept. 10	North Fork of Little Wichita River.	Red River	2,000 feet below Archer City-Holliday highway bridge, Archer County, Tex.		[a]4,950
July 24	Ecore Fabre Creek	Ouachita River	Mouth, near Camden, Ark		.9

[a] Computed by slope-area method.

Digitized by Google

Digitized by Google

INDEX

	Page
Accuracy of data and computed results	4–5
Acre-foot, definition of	2
Appropriations, record of	1
Arkadelphia, Ark., Ouachita River at	80
Arkansas River at Arkansas City, Kans.	49
at Garden City, Kans.	46
at Larned, Kans.	47
at Little Rock, Ark.	51
at Syracuse, Kans.	45
at Van Buren, Ark.	50
near Wichita, Kans.	48
Arkansas River Basin, Kans.-Ark.-Okla.-Mo., gaging-station records in	45–61
Bardley, Mo., Eleven Point River near	41
Battlefield, Mo., James River below	31
James River near	30
Bayou Bartholomew near Beekman, La.	84
Bayou Dorcheat near Minden, La	77
Beaver, Ark., White River at	26
Beekman, La., Bayou Bartholomew near	84
Belzoni, Okla., Kiamichi River near	73
Big Lake outlet near Manila, Ark.	25
Big River at Byrnesville, Mo.	16
Big Spring near Van Buren, Mo.	40
Black River at Black Rock, Ark.	37
at Leeper, Mo.	36
Black Rock, Ark., Black River at	37
Blue Spring, Mo., discharge measurement of	85
Bourbeuse River at Union, Mo.	15
Buffalo River near Rush, Ark.	33
Byrnesville, Mo., Big River at	16
Cache River at Patterson, Ark.	44
Camden, Ark., Ouachita River near	81
Castor River at Zalma, Mo.	17
Coldwater River near Coldwater, Miss.	65–66
Computations, results of, accuracy of	4–5
Control, definition of	2
Cooperation, record of	10
Cottonwood River at Elmdale, Kans.	59
Crowell, Tex., Pease River near	71
Current River at Doniphan, Mo.	39
at Van Buren, Mo.	38
Cypress Creek near Jefferson, Tex.	76
Darden, Tex., Sulphur River near	75
Data, accuracy of	4–5
explanation of	2–4
De Valls Bluff, Ark., White River at	29
Denison, Tex., Red River near	68
Doniphan, Mo., Current River at	39
Dry Fork, Mo., discharge measurement of	85
Durwood, Okla., Washita River near	71–72
Ecore Fabre Creek, Ark., discharge measurement of	85
Eleven Point River, Ark., discharge measurement of	85
Eleven Point River near Bardley, Mo.	41
Elmdale, Kans., Cottonwood River at	59
Enid, Miss., Yocona River near	63–64
Eureka, Mo., Meramec River near	13
Flippin, Ark., White River near	27
Galena, Mo., James River at	32
Garden City, Kans., Arkansas River at	46
Garland City, Ark., Red River at	69
Greer Spring at Greer, Mo.	42
Grenada, Miss., Yalobusha River at	66–67
Grove, Okla., Neosho River near	58
Headwater Diversion Channel Basin, Mo., gaging-station record in	17
Heber Springs, Ark., Little Red River near	43
Henderson, Ark., North Fork of White River near	35
Hot Springs, Ark., Ouachita River near	78
Huzzah Creek, Mo., discharge measurement of	85
Independence, Kans., Verdigris River at	55
Iola, Kans., Neosho River near	56
James River at Galena, Mo.	32
below Battlefield, Mo.	31
near Battlefield, Mo.	30
Jefferson, Tex., Cypress Creek near	76
Joplin, Mo., Shoal Creek near	61
Kennett, Mo., Little River ditch No. 81 near	19
Little River ditch No. 1 near	20
Little River ditch No. 66 near	21
Little River ditch No. 66–A near	22
Little River ditch No. 251 near	23
Little River ditch No. 259 near	24
Kiamichi River near Belzoni, Okla.	73
Larned, Kans., Arkansas River at	47
Pawnee River near	52
Leeper, Mo., Black River at	36
Little Arkansas River at Valley Center, Kans.	53
Little Missouri River near Murfreesboro, Ark.	82
Little Red River near Heber Springs, Ark.	43
Little River near Wilton, Ark.	74
Little River ditch No. 81 near Kennett, Mo.	19
Little River ditch No. 1 near Kennett, Mo.	20
Little River ditch No. 66 near Kennett, Mo.	21
Little River ditch No. 66–A near Kennett, Mo.	22
Little River ditch No. 251 near Kennett, Mo.	23
Little River ditch No. 259 near Kennett, Mo.	24
Little Rock, Ark., Arkansas River at	51
Little Wichita River, Tex., North Fork of, discharge measurement of	85

Digitized by Google

	Page
Malvern, Ark., Ouachita River near	79
Manila, Ark., Big Lake outlet near	25
Marked Tree, Ark., St. Francis River floodway near	18
Meramec River near Eureka, Mo.	13
near Steelville, Mo.	11
near Sullivan, Mo.	12
Meramec River Basin, Mo., gaging-station records in	11–16
Meramec Springs near St. James, Mo.	14
Minden, La., Bayou Dorcheat near	77
Mulberry River, Ark., discharge measurements of	85
Murfreesboro, Ark., Little Missouri River near	82
Neosho River near Grove, Okla.	58
near Iola, Kans.	56
near Parsons, Kans.	57
Newport, Ark., White River near	28
Obion River, Tenn., Middle Fork of, discharge measurements of	85
Ouachita River at Arkadelphia, Ark.	80
at Remmel Dam, near Malvern, Ark.	79
near Camden, Ark.	81
near Hot Springs, Ark.	78
Parsons, Kans., Neosho River near	57
Patterson, Ark., Cache River at	44
Pawnee River near Larned, Kans.	52
Pease River near Crowell, Tex.	71
Publications, information concerning	5–6
obtaining or consulting of	6–7
on stream flow, lists of	7–8
Red River at Garland City, Ark.	69
at Shreveport, La.	70
near Denison, Tex.	68
Red River Basin, Tex.-La.-Okla.-Ark., gaging station records in	68–84
Run-off in inches, definition of	2
Rush, Ark., Buffalo River near	33
St. Francis River, Ark., discharge measurements of	85
St. Francis River floodway near Marked Tree, Ark.	18
St. Francis River Basin, Ark.-Mo., gaging-station records in	18–25
St. James, Mo., Meramec Springs near	14
Saline River near Warren, Ark.	83
Sardis, Miss., Tallahatchie River near	62–63
Second-feet per square mile, definition of	2
Second-foot, definition of	2
Shoal Creek near Joplin, Mo.	61
Shreveport, La., Red River at	70
Spring River near Waco, Mo.	60
Stage-discharge relation, definition of	2
Steelville, Mo., Meramec River near	11
Strawberry River, Ark., discharge measurement of	85
Sullivan, Mo., Meramec River near	12
Sulphur River near Darden, Tex.	75
Syracuse, Kans., Arkansas River at	45
Tallahatchie River near Sardis, Miss.	62–63
Tecumseh, Mo., North Fork of White River at	34
Terms, definition of	2
Union, Mo., Bourbeuse River at	15
Valley Center, Kans., Little Arkansas River at	53
Van Buren, Ark., Arkansas River at	50
Van Buren, Mo., Big Spring near	40
Current River at	38
Verdigris River at Independence, Kans.	55
Waco, Mo., Spring River near	60
Walnut River at Winfield, Kans.	54
Warren, Ark., Saline River near	83
Washita River near Durwood, Okla.	71–72
White River at Beaver, Ark.	26
at De Valls Bluff, Ark.	29
near Flippin, Ark.	27
near Newport, Ark.	28
North Fork of, at Tecumseh, Mo.	34
near Henderson, Ark.	35
White River Basin, Ark.-Mo., gaging-station records in	26–44
Wichita, Kans., Arkansas River near	48
Wilton, Ark., Little River near	74
Winfield, Kans., Walnut River at	54
Work, authorization of	1–2
division of	10
scope of	1–2
Yalobusha River at Grenada, Miss.	66–67
Yazoo River Basin, Miss., gaging-station records in	62–67
Yocona River near Enid, Miss.	63–64
Zalma, Mo., Castor River at	17

Digitized by Google

PLEASE DO NOT DESTROY OR THROW AWAY THIS PUBLICATION. If you have no further use for it, write to the Geological Survey at Washington and ask for a frank to return it

UNITED STATES DEPARTMENT OF THE INTERIOR

SURFACE WATER SUPPLY *of the* UNITED STATES 1929

PART VIII

WESTERN GULF OF MEXICO BASINS

Prepared in cooperation with the
STATE OF TEXAS

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 688

GEOLOGY DEPARTMENT
STANFORD UNIVERSITY

Digitized by Google

Digitized by Google

UNITED STATES DEPARTMENT OF THE INTERIOR
RAY LYMAN WILBUR, Secretary
GEOLOGICAL SURVEY
W. C. Mendenhall, Director

Water-Supply Paper 688

SURFACE WATER SUPPLY *of the* UNITED STATES 1929

PART VIII

WESTERN GULF OF MEXICO BASINS

NATHAN C. GROVER, Chief Hydraulic Engineer
C. E. ELLSWORTH, District Engineer

Prepared in cooperation with the
STATE OF TEXAS

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1932

For sale by the Superintendent of Documents, Washington, D. C. - - - Price 25 cents (Paper cover)

Digitized by Google

Digitized by Google

CONTENTS

	Page
Authorization and scope of work	1
Definition of terms	2
Explanation of data	2
Accuracy of field data and computed results	4
Publications	5
Cooperation	10
Division of work	10
Gaging-station records	11
Sabine River Basin	11
Sabine River near Longview, Tex	11
Sabine River at Logansport, La	12
Sabine River near Bon Wier, Tex	12
Sabine River near Ruliff, Tex	13
Neches River Basin	14
Neches River near Rockland, Tex	14
Neches River at Evadale, Tex	15
Angelina River near Lufkin, Tex	16
Angelina River at Horger, Tex	17
Trinity River Basin	18
West Fork of Trinity River at Bridgeport, Tex	18
West Fork of Trinity River at Lake Worth Dam, above Fort Worth, Tex	19
West Fork of Trinity River at Fort Worth, Tex	20
West Fork of Trinity River at Grand Prairie, Tex	21
Trinity River at Dallas, Tex	22
Trinity River near Oakwood, Tex	23
Trinity River at Riverside, Tex	23
Trinity River at Romayor, Tex	24
Clear Fork of Trinity River at Fort Worth, Tex	25
Village Creek near Handley, Tex	26
Mountain Creek near Grand Prairie, Tex	26
Elm Fork of Trinity River near Carrollton, Tex	27
East Fork of Trinity River near Rockwall, Tex	28
San Jacinto River Basin	29
San Jacinto River near Humble, Tex	29
Brazos River Basin	30
Double Mountain Fork of Brazos River near Aspermont, Tex	30
Brazos River at Seymour, Tex	31
Brazos River near Mineral Wells, Tex	32
Brazos River near Glen Rose, Tex	33
Brazos River at Waco, Tex	34
Brazos River near Bryan, Tex	35
Brazos River at Rosenberg, Tex	36
Clear Fork of Brazos River at Nugent, Tex	37
Clear Fork of Brazos River at Fort Griffin, Tex	38
Clear Fork of Brazos River at Crystal Falls, Tex	39

Digitized by Google

Gaging-station records—Continued.
Brazos River Basin—Continued. Page
Clear Fork of Brazos River near Crystal Falls, Tex 40
North Bosque River near Clifton, Tex 41
South Bosque River near Speegleville, Tex 42
Leon River near Hamilton, Tex 43
Leon River near Belton, Tex 44
Little River near Little River, Tex 45
Little River at Cameron, Tex 46
Lampasas River at Youngsport, Tex 47
San Gabriel River at Circleville, Tex 48
Yegua Creek near Somerville, Tex 49
Navasota River near Easterly, Tex 50
Colorado River Basin 51
Colorado River at Ballinger, Tex 51
Colorado River near Milburn, Tex 52
Colorado River near Tow, Tex 53
Colorado River at Austin, Tex 54
Evaporation near Austin, Tex 55
Colorado River at Columbus, Tex 56
Concho River near San Angelo, Tex 57
Concho River near Paint Rock, Tex 58
North Concho River near Carlsbad, Tex 59
North Concho River at San Angelo, Tex 60
Pecan Bayou at Brownwood, Tex 61
San Saba River at Menard, Tex 62
San Saba River near San Saba, Tex 63
Noyes Canal at Menard, Tex 64
North Llano River near Junction, Tex 65
Llano River near Junction, Tex 66
Llano River near Castell, Tex 67
Pedernales River at Stonewall, Tex 68
Pedernales River near Spicewood, Tex 69
Onion Creek near Del Valle, Tex 70
Guadalupe River Basin 71
Guadalupe River near Comfort, Tex 71
Guadalupe River near Spring Branch, Tex 72
Guadalupe River above Comal River, at New Braunfels, Tex 73
Guadalupe River below Cuero, Tex 74
Guadalupe River seepage investigation 75
Comal River at New Braunfels, Tex 76
Blanco River at Wimberly, Tex 77
San Marcos River at Ottine, Tex 78
Plum Creek near Lockhart, Tex 79
San Antonio River at San Antonio, Tex 80
San Antonio River near Falls City, Tex 81
San Antonio River at Goliad, Tex 82
San Pedro Creek at San Antonio, Tex 82
Medina River near Pipe Creek, Tex 84
Medina River near Riomedina, Tex 85
Medina Canal near Riomedina, Tex 86
Cibolo Creek at Sutherland Springs, Tex 87

Digitized by Google

Gaging-stations records—Continued. Page
Nueces River Basin 88
Nueces River at Laguna, Tex 88
Nueces River near Uvalde, Tex 89
Nueces River at Cotulla, Tex 90
Nueces River near Three Rivers, Tex 91
Nueces River at Calallen, Tex 92
Frio River at Concan, Tex 93
Frio River near Derby, Tex 94
Leona River near Divot, Tex 94
Rio Grande Basin 95
Rio Grande at San Marcial, N. Mex 95
Rio Grande below Elephant Butte Dam, N. Mex 96
Rio Grande near El Paso, Tex 97
Rio Grande at Tornillo Bridge, near Fabens, Tex 98
Rio Grande below Old Fort Quitman, near Finlay, Tex 99
Rio Grande at Boquillas, Tex 100
Rio Grande at Langtry, Tex 101
Rio Grande near Del Rio, Tex 102
Rio Grande at Eagle Pass, Tex 103
Rio Grande at Roma, Tex 104
Rio Grande at Hidalgo, Tex 105
Pecos River near Angeles, Tex 106
Pecos River near Comstock, Tex 107
Limpia Creek near Fort Davis, Tex 108
Goodenough Springs near Comstock, Tex 109
Devils River near Juno, Tex 110
Devils River near Del Rio, Tex 111
Devils River seepage investigations 112
Pinto Creek near Del Rio, Tex 119
Goodwin Canal above Penitas, Tex 120
Edinburg Canal at Penitas, Tex 121
Mission Canal near Mission, Tex 122
Granjeno Canal near Mission, Tex 123
McAllen Canal near Hidalgo, Tex 124
Rio Bravo Canal near Hidalgo, Tex 125
Miscellaneous discharge measurements 126
Index 129

ILLUSTRATION

FIGURE 1. Typical river-measurement station showing concrete well and house for water-stage recorder and staff gages, cable, and car. 3

Digitized by Google

Digitized by Google

SURFACE WATER SUPPLY OF WESTERN GULF OF MEXICO BASINS, 1929

AUTHORIZATION AND SCOPE OF WORK

This volume is one of a series of 14 reports presenting records of measurements of flow made on streams in the United States during the year ending September 30, 1929.

The data presented in these reports were collected by the United States Geological Survey under the following authority contained in the organic law (20 Stat. L. 394):

Provided, That this officer [the Director] shall have the direction of the Geological Survey and the classification of public lands and examination of the geological structure, mineral resources, and products of the national domain.

The work was begun in 1888 in connection with special studies relating to irrigation. Since the fiscal year ending June 30, 1895, successive appropriation bills passed by Congress have carried the following items:

For gaging the streams and determining the water supply of the United States, and for the investigation of underground currents and artesian wells, and for the preparation of reports upon the best methods of utilizing the water resources.

Annual appropriations for the fiscal years ending June 30, 1895–1930

1895	$12,500.00	1919	$148,244.10
1896	24,500.00	1920	175,000.00
1897–1899	50,000.00	1921–1923	180,000.00
1900	70,000.00	1924–1925	170,000.00
1901–1902	100,000.00	1926	165,000.00
1903–1906	200,000.00	1927	151,000.00
1907	150,000.00	1928	147,000.00
1908–1910	100,000.00	1929	270,500.00
1911–1917	150,000.00	1930	275,000.00
1918	175,000.00		

In execution of the work many private and State organizations have cooperated either by furnishing data or by assisting in collecting data. Acknowledgments for cooperation of the first kind are made in connection with the description of each station affected; cooperation of the second kind is acknowledged on page 10.

Measurements of stream flow have been made at about 5,830 points in the United States and also at many points in Alaska and the Hawaiian Islands. In July, 1929, 2,240 gaging stations were being maintained by the Geological Survey and the cooperating organizations. Many miscellaneous discharge measurements were made at other points. In connection with this work data were also col-

Digitized by Google

lected in regard to precipitation, evaporation, storage reservoirs, river profiles, and water power in many sections of the country and will be made available in water-supply papers from time to time.

DEFINITION OF TERMS

The volume of water flowing in a stream—the "run-off" or "discharge"—is expressed in various terms, each of which has become associated with a certain class of work. These terms may be divided into two groups—(1) those that represent a rate of flow, as second-feet, gallons per minute, miner's inches, and discharge in second-feet per square mile, and (2) those that represent the actual quantity of water, as run-off in inches, acre-feet, and millions of cubic feet. The principal terms used in this series of reports are second-feet, second-feet per square mile, run-off in inches, acre-feet and millions of cubic feet. They may be defined as follows:

"Second-feet" is an abbreviation for "cubic feet per second." A second-foot is the rate of discharge of water flowing in a channel of rectangular cross section 1 foot wide and 1 foot deep at an average velocity of 1 foot per second. It is generally used as a fundamental unit from which others are computed.

"Second-feet per square mile" is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the run-off is distributed uniformly both as regards time and area.

"Run-off in inches" is the depth to which an area would be covered if all the water flowing from it in a given period were uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in inches.

An "acre-foot," equivalent to 43,560 cubic feet, is the quantity required to cover an acre to the depth of 1 foot. The term is commonly used in connection with storage for irrigation.

The following terms not in common use are here defined:

"Stage-discharge relation," an abbreviation for the term "relation of gage height to discharge."

"Control," a term used to designate the natural section or stretch of the channel or artificail structure below the gage which determines the stage-discharge relation at the gage.

EXPLANATION OF DATA

The data presented in this report cover the year beginning October 1, 1928, and ending September 30, 1929. At the beginning of January in most parts of the United States much of the precipitation in the preceding three months is stored in the form of snow or ice, or in ponds, lakes, and swamps, or as underground water, and this stored water passes off in the streams during the spring breakup. At the

Digitized by Google

end of September, on the other hand, the only stored water available for run-off is possibly a small quantity in the ground; therefore the run-off for the year beginning October 1 is practically all derived from precipitation within that year.

The base data collected at gaging stations consist of records of stage, measurements of discharge, and general information used to

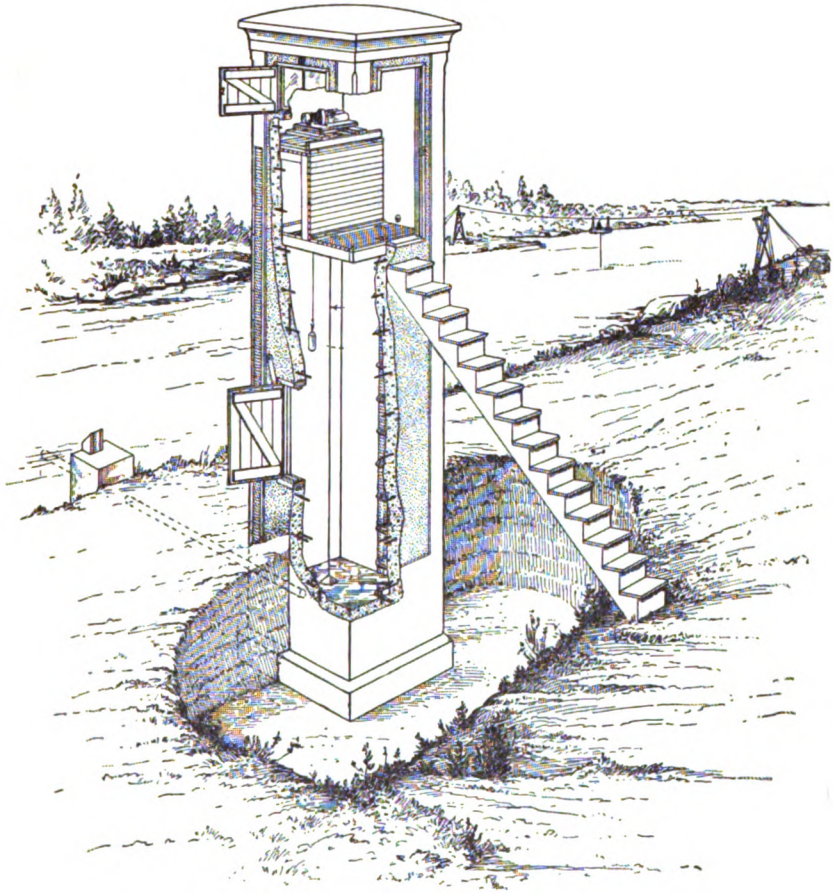

FIGURE 1.—Typical river-measurement station showing concrete well and house for water-stage recorder and staff gages, cable, and car

supplement the gage heights and discharge measurements in determining the daily flow. The records of stage are obtained either from direct readings on a staff or chain gage or from a water-stage recorder that gives a continuous record of the fluctuations. Measurements of discharge are made with a current meter, by the general methods outlined in standard textbooks on the measurement of river discharge. A typical gaging station, equipped with water-stage recorder and measuring cable and car, is shown in Figure 1.

Digitized by Google

From the discharge measurements rating tables are prepared that give the discharge for any stage. The application of the daily gage height to these rating tables gives the discharge from which the monthly and yearly mean discharge is determined.

The data presented for each gaging station in the area covered by this report comprise a description of the station, a table showing the daily discharge of the stream, and a table of monthly and yearly discharge and run-off.

The description of the station gives, in addition to statements regarding location and type of gage, information as to diversions that decrease the flow at the gage, artificial regulation, maximum and minimum recorded stages, and the accuracy of the records. The maximum discharge given under "Extremes" represents the crest discharge determined from records of stage by water-stage recorders or, where nonrecording gages are installed, from flood marks or from graphs based on gage readings made once daily or oftener.

The table of daily discharge gives, in general, the discharge in second-feet corresponding to the daily gage height, which may be a once daily reading or the mean of twice daily readings of a nonrecording gage or the mean daily gage height obtained from a water-stage recorder graph.

At stations on streams subject to sudden or rapid diurnal fluctuation the discharge obtained from the rating table and the mean daily gage height may not be the true mean discharge for the day. If such stations are equipped with water-stage recorders, the mean daily discharge may be obtained by averaging discharge at regular intervals during the day or by using the discharge integrator, an instrument for obtaining mean daily discharge from a continuous gage-height graph and containing as an essential element the rating curve of the station. At nonrecording gage stations, the mean daily discharge during flashy floods is determined from gage-height graphs based on gage readings made once daily or oftener.

In the table of monthly discharge the column headed "Maximum" gives the maximum daily discharge and not the discharge when the water surface was at crest height. Likewise, in the column headed "Minimum" the quantity given is the minimum daily discharge. The column headed "Mean" is the average flow in cubic feet per second during the month. On this average flow are based computations recorded in the remaining columns, which are defined on page 2.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS

The accuracy of stream-flow data depends primarily (1) on the permanency of the stage-discharge relation and (2) on the accuracy of observation of stage, measurements of flow, and interpretation of records.

Digitized by Google

The station description gives a statement in regard to the general accuracy of the records. "Excellent" indicates that records are accurate within 5 per cent; "good," within 10 per cent; "fair," within 15 per cent; and "poor," 20 per cent or more.

The monthly means for any station may represent with high accuracy the quantity of water flowing past the gage, but the figures showing discharge per square mile and run-off in inches may be subject to gross errors caused by the inclusion of large noncontributing districts in the measured drainage area, by lack of information concerning water diverted for irrigation or other use, or by inability to interpret the effect of artificial regulation of the flow of the river above the station. "Second-feet per square mile" and "run-off in inches" are therefore not computed if such errors appear probable. The computations are also omitted for stations on streams draining areas in which the annual rainfall is less than 20 inches.

The table of monthly discharge gives a general idea of the flow at the station. The table of daily discharge allows more detailed studies of the variation in flow. It should be borne in mind, however, that the observations in each succeeding year may be expected to throw new light on data previously published.

Many gaging stations on streams in the irrigated areas of the United States are situated above most of the diversions from those streams, and the discharge recorded does not show the water supply available for further development, as prior appropriations below the stations must first be satisfied.

PUBLICATIONS

Investigations of water resources by the United States Geological Survey has consisted in large part of measurements of the volume of flow of streams and studies of the conditions affecting that flow, but it has comprised also investigation of such closely allied subjects as irrigation, water storage, water powers, underground waters, and quality of waters. Most of the results of these investigations have been published in the series of water-supply papers, but some have appeared in the bulletins, professional papers, monographs, and annual reports.

The results of stream-flow measurements are now published annually in 12 parts, each part covering an area whose boundaries coincide with natural-drainage features as indicated below:

PART I. North Atlantic slope basins (St. John River to York River).
II. South Atlantic slope and eastern Gulf of Mexico Basins (James River to the Mississippi).
III. Ohio River Basin.
IV. St. Lawrence River Basin.
V. Hudson Bay and upper Mississippi River Basins.
VI. Missouri River Basin.
VII. Lower Mississippi River Basin.
VIII. Western Gulf of Mexico Basins.

Digitized by Google

IX. Colorado River Basin.
X. The Great Basin.
XI. Pacific slope basins in California.
XII. North Pacific slope drainage basins, in three parts:
A, Pacific slope basins in Washington and upper Columbia River Basin.
B, Snake River Basin.
C, Pacific slope basins in Oregon and lower Columbia River Basin.

Water-supply papers and other publications of the United States Geological Survey containing data in regard to the water resources of the United States may be obtained or consulted as indicated below.

1. Copies may be purchased at nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D. C., who will, on application, furnish lists giving prices.

2. Sets of the reports may be consulted in the libraries of the principal cities in the United States.

3. Sets are available for consultation in the local offices of the water-resources branch of the Geological Survey, as follows:

Augusta, Me., Statehouse.
Boston, Mass., 2500 Customhouse.
Hartford, Conn., 60 Washington Street.
Albany, N. Y., 506 Broadway-Arcade Building.
Trenton, N. J., 710 Trenton Trust Building.
Harrisburg, Pa., 366 Claster Building.
Charlottesville, Va., Brookes Museum, University of Virginia.
South Charleston, W. Va., Naval Ordnance Plant.
Asheville, N. C., 220 Post Office Building.
Columbia, S. C., 801 National Loan & Exchange Bank Building.
Ocala, Fla., Post Office Building.
Chattanooga, Tenn., 630 Power Building.
Tuscaloosa, Ala., Post Office Building.
Columbus, Ohio, Engineering Experiment Station, Ohio State University.
Chicago, Ill., 1503 Consumers Building.
Indianapolis, Ind., 319 Federal Building.
Madison, Wis., 337N State Capitol.
St. Paul. Minn., 202 Old State Capitol.
Topeka, Kans., 23 Federal Building.
Rolla, Mo., Rolla Building, School of Mines and Metallurgy.
Fort Smith, Ark., Post Office Building.
Austin, Tex., State Capitol.
Santa Fe, N. Mex., State Capitol.
Tucson, Ariz., 210 Post Office Building.
Denver, Colo., 403 Post Office Building.
Salt Lake City, Utah, 313 Federal Building.
Idaho Falls, Idaho, 228 Federal Building.
Boise, Idaho, Federal Building.
Helena, Mont., 416 Power Block.
Tacoma, Wash., 406 Federal Building.
Portland, Oreg., 606 Post Office Building.
San Francisco, Calif., 303 Customhouse.
Los Angeles, Calif., 751 South Figueroa Street, room 510.
Honolulu, Hawaii, Territorial Office Building.

Digitized by Google

A list of the Geological Survey's publications may be obtained by applying to the Director, United States Geological Survey, Washington, D. C.

Stream-flow records have been obtained at about 5,830 points in the United States, and the data obtained have been published in the reports tabulated below.

Stream-flow data in reports of the United States Geological Survey

[A = Annual Report; B = Bulletin; W = Water-Supply Paper]

Report	Character of data	Year
10th A, pt. 2	Descriptive information only	
11th A, pt. 2	Monthly discharge and descriptive information	1884 to Sept., 1890.
12th A, pt. 2	do	1884 to June 30, 1891.
13th A, pt. 3	Mean discharge in second-feet	1884 to Dec. 31, 1892.
14th A, pt. 2	Monthly discharge (long-time records, 1871 to 1893)	1888 to Dec. 31, 1893.
B 131	Descriptions, measurements, gage heights, and ratings	1893 and 1894.
16th A, pt. 2	Descriptive information only	
B 140	Descriptions, measurements, gage heights, ratings, and monthly discharge (also many data covering earlier years).	1895.
W 11	Gage heights (also gage heights for earlier years)	1896.
18th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also similar data for some earlier years).	1895 and 1896.
W 15	Descriptions, measurements, and gage heights, eastern United States, eastern Mississippi River, and Missouri River above junction with Kansas.	1897.
W 16	Descriptions, measurements, and gage heights, western Mississippi River below junction of Missouri and Platte, and western United States.	1897.
19th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also some long-time records).	1897.
W 27	Measurements, ratings, and gage heights, eastern United States, eastern Mississippi River, and Missouri River.	1898.
W 28	Measurements, ratings, and gage heights, Arkansas River and western United States.	1898.
20th A, pt. 4	Monthly discharge (also for many earlier years)	1898.
W 35 to 39	Descriptions, measurements, gage heights, and ratings	1899.
21st A, pt. 4	Monthly discharge	1899.
W 47 to 52	Descriptions, measurements, gage heights, and ratings	1900.
22d A, pt. 4	Monthly discharge	1900.
W 65, 66	Descriptions, measurements, gage heights, and ratings	1901.
W 75	Monthly discharge	1901.
W 82 to 85	Complete data	1902.
W 97 to 100	do	1903.
W 124 to 135	do	1904.
W 165 to 178	do	1905.
W 201 to 214	do	1906.
W 241 to 252	do	1907–8.
W 261 to 272	do	1909.
W 281 to 292	do	1910.
W 301 to 312	do	1911.
W 321 to 332	do	1912.
W 351 to 362	do	1913.
W 381 to 394	do	1914.
W 401 to 414	do	1915.
W 431 to 444	do	1916.
W 451 to 464	do	1917.
W 471 to 484	do	1918.
W 501 to 514	do	1919–20.
W 521 to 534	do	1921.
W 541 to 554	do	1922.
W 561 to 574	do	1923.
W 581 to 594	do	1924.
W 601 to 614	do	1925.
W 621 to 634	do	1926.
W 641 to 654	do	1927.
W 661 to 674	do	1928.
W 681 to 694	do	1929.

The records at most of the stations discussed in these reports extend over a series of years. Miscellaneous measurements at many points other than regular gaging stations have been made each year

Digitized by Google

and are published under "Miscellaneous discharge measurements" at the end of each report, in the same relative order as the regular gaging stations. An index of the reports containing records obtained prior to 1904 has been published in Water-Supply Paper 119.

The following table gives, by years and drainage basins, the numbers of the papers on surface-water supply published from 1899 to 1929. The data for any particular station will be found in the reports covering the years during which the station was maintained. For example, data from 1910 to 1920 for any station in the area covered by Part III are published in Water-Supply Papers 283, 303, 323, 353, 383, 403, 433, 453, 473, and 503, which contain records for the Ohio River Basin for those years.

Digitized by Google

Numbers of water-supply papers containing results of stream measurements, 1899–1929

[For basins included see p. 5]

Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII-A	XII-B	XII-C
1899 [a]	35	[b] 35, 36	36	36	36	[a] 36, 37	37	37	[d] 37, 38	38, [a] 39	38, [f] 39	38	38	38
1900 [a]	47, [b] 48	48	48, [c] 49	49	49	49, [f] 50	50	50	50	51	51	15	51	51
1901	65, 75	65, 75	65, 75	65, 75	[b] 65, 66, 75	66, 75	[b] 65, 66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75
1902	82	[b] 82, 83	83	[f] 82, 83	[b] 83, 85	84	[b] 83, 84	84	85	85	85	85	85	85
1903	97	[b] 97, 98	98	97	[b] 98, 99, [m] 100	99	[b] 98, 99	99	100	100	100	100	100	100
1904	[n] 124, [a] 125 [p] 126	[p] 126, 127	128	129	[b] 128, 130	130, [e] 131	[b] 128, 131	132	123	133, [r] 134	134	135	135	135
1905	[n] 165, [a] 166 [p] 167	[p] 167, 168	169	170	171	172	[b] 169, 173	174	175, [a] 177	176, [r] 177	177	178	178	[g] 177, 178
1906	[n] 201, [a] 202 [p] 203	[p] 203, 204	206	206	207	208	[b] 205, 209	210	211, [a] 213	212, [r] 213	213	214	214	214
1907–8	241	242	243	244	245	246	247	248	249	250, [r] 251	251	252	252	252
1909	261	262	263	264	265	266	267	268	269	270, [r] 271	271	272	272	272
1910	281	282	283	284	285	286	287	288	289	290	291	292	292	292
1911	301	302	303	304	305	306	307	308	309	310	311	312	312	312
1912	321	322	323	324	325	326	327	328	329	330	331	332-A	332-B	332-C
1913	351	352	353	354	355	356	357	358	359	360	361	362-A	362-B	362-C
1914	381	382	383	384	385	386	387	388	389	390	391	392	393	394
1915	401	402	403	404	405	406	407	408	409	410	411	412	413	414
1916	431	432	433	434	435	436	437	438	439	440	441	442	443	444
1917	451	452	453	454	455	456	457	458	459	460	461	462	463	464
1918	471	472	473	474	475	476	477	478	479	480	481	482	483	484
1919–20	501	502	503	504	505	506	507	508	509	510	511	512	513	514
1921	521	522	523	524	525	526	527	528	529	530	531	532	533	534
1922	541	542	543	544	545	546	547	548	549	550	551	552	553	554
1923	561	562	563	564	565	566	567	568	569	570	571	572	573	574
1924	581	582	583	584	585	586	587	588	589	590	591	592	593	594
1925	601	602	603	604	605	606	607	608	609	610	611	612	613	614
1926	621	622	623	624	625	626	627	628	629	630	631	632	633	634
1927	641	642	643	644	645	646	647	648	649	650	651	652	653	654
1928	661	662	663	664	665	666	667	668	669	670	671	672	673	674
1929	681	682	683	684	685	686	687	688	689	690	691	692	693	694

[a] Rating tables and index to Water-Supply Papers 35–39 contained in Water-Supply Paper 39. Tables for monthly discharge for 1899 in Twenty-first Annual Report, Part IV.

[b] James River only.

[c] Gallatin River.

[d] Green and Gunnison Rivers and Grand River above junction with Gunnison.

[e] Mohave River only.

[f] Kings and Kern Rivers and South Pacific slope basins.

[g] Rating tables and index to Water-Supply Papers 47–52 and data on precipitation, wells, and irrigation in California and Utah contained in Water-Supply Paper 52. Tables of monthly discharge for 1900 in Twenty-second Annual Report, Part IV.

[h] Wissahickon and Schuylkill Rivers to James River.

[i] Scioto River.

[j] Loup and Platte Rivers near Columbus, Nebr., and all tributaries below junction with Platte.

[k] Tributaries of Mississippi from east.

[l] Lake Ontario and tributaries to St. Lawrence River proper.

[m] Hudson Bay only.

[n] New England rivers only.

[o] Hudson River to Delaware River, inclusive.

[p] Susquehanna River to Yadkin River, inclusive.

[q] Platte and Kansas Rivers.

[r] Great Basin in California, except Truckee and Carson River Basins.

[s] Below junction with Gila.

[t] Rogue, Umpqua, and Siletz Rivers only.

Digitized by Google

COOPERATION

The work in Texas was carried on in cooperation with the State through the board of water engineers, John A. Norris, chairman, to whom special acknowledgments are due for the efficient and cordial manner in which the members of the board represented the State in the investigations.

Acknowledgment is due also the Corps of Engineers, United States Army, the United States Weather Bureau, and the American section of the International Boundary Commission for financial assistance and aid in the collection of records.

Financial assistance and aid in collecting records was also rendered by the following cities, corporations, and individuals: Corpus Christi, Dallas, Forth Worth, San Antonio, Brownwood, Breckenridge Chamber of Commerce, Walker-Caldwell Water Co., Medina Valley Irrigation Co., Tarrant County Water Improvement District No. 1, St. Louis Southwestern Railway, International-Great Northern Railroad, Galveston, Harrisburg & San Antonio Railway, Gulf, Colorado & Santa Fe Railway, Central Power & Light Co., Humble Oil & Refining Co., San Antonio Public Service Co., Zavalla County Water Improvement District No. 2, Texas Power & Light Co., Central & Southwest Utilities Co., Brown County Water Improvement District No. 1, and E. N. Cory.

DIVISION OF WORK

Data for stations in Texas and New Mexico were collected and prepared for publication under the direction of C. E. Ellsworth, district engineer, who was assisted by Trigg Twichell, H. C. Prichett, Seth D. Breeding, Tate Dalrymple, W. C. Dodd, G. W. King, C. B. Tooley, A. C. Cook, G. E. Ferguson, N. C. Magnuson, Kate Casparis, A. B. Goodwin, C. A. Young, B. M. Pember, B. S. Odom, V. W. Rupp, V. L. Austin, S. H. Crowell, F. C. Ames, P. H. Holland, J. M. Terry, R. W. Yarborough, jr., W. M. Littlefield, A. A. Fishback, and E. B. Rice.

The records were reviewed and the manuscript assembled by F. F. Schrader.

Digitized by Google

GAGING-STATION RECORDS

SABINE RIVER BASIN

SABINE RIVER NEAR LONGVIEW, TEX.

LOCATION.—Staff gage just below International-Great Northern Railroad bridge 3 miles southwest of Longview, Gregg County.

DRAINAGE AREA.—3,010 square miles.

RECORDS AVAILABLE.—January, 1904, to December, 1906, and October, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, about 22,300 second-feet Dec. 26 (gage height, 29.95 feet); minimum, 15 second-feet Aug. 27 to Sept. 7 (gage height, 2.00 feet).

1904–1906, 1923–1929: Maximum discharge, that of Dec. 26, 1928; minimum, 14 second-feet Aug. 29–31, 1925 (gage height, 1.10 feet).

REMARKS.—Monthly records fair. Daily records not sufficiently accurate for publication. No sizable diversions. Slight regulation at extremely low stages caused by pumping just above gage.

Monthly discharge, in second-feet, 1928–29

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	206	40	147	9,040
November	3,050	310	1,020	60,700
December	21,600	310	6,440	396,000
January	9,960	2,140	5,750	354,000
February	8,060	1,710	3,760	209,000
March	5,810	1,000	3,600	221,000
April	4,620	929	1,970	117,000
May	15,800	836	6,230	383,000
June	11,600	233	5,340	318,000
July	1,420	77	351	21,600
August	77	15	40.4	2,480
September	1,220	15	359	21,400
The year	21,600	15	2,920	2,110,000

Digitized by Google

SABINE RIVER AT LOGANSPORT, LA.

LOCATION.—Chain gage on highway bridge 200 feet above Houston East & West Texas Railway bridge and a quarter of a mile west of railway station in Logansport, De Soto Parish. Zero of gage, 147.5 feet above mean sea level.

DRAINAGE AREA.—4,860 square miles.

RECORDS AVAILABLE.—July, 1903, to December, 1906, and October, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year not determined; minimum, 47 second-feet Sept. 3–7 (gage height, −0.7 foot).

1903–1906, 1923–1929: Maximum discharge not determined (gage height, 35.8 feet May 26, 1905); minimum discharge, probably less than 27 second-feet September, 1925.

Maximum stage known, 39.4 feet reached during 1884.

REMARKS.—Monthly records fair. Records of daily discharge not sufficiently accurate for publication. No diversions. Gage-height record furnished by United States Weather Bureau.

Monthly discharge, in second-feet, 1928–29

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	305	----------	190	11,700
November	3,960	128	1,450	86,300
December	8,580	1,020	4,670	287,000
January	----------	----------	• 9,420	579,000
February	8,840	3,260	5,870	326,000
March	6,660	2,780	5,440	334,000
April	3,660	2,060	2,840	169,000
May	----------	1,290	4,990	307,000
June	----------	470	7,470	444,000
July	1,050	159	573	35,200
August	----------	51	• 80.0	4,920
September	1,170	47	338	20,100
The year	----------	47	3,600	2,600,000

• Estimated.

SABINE RIVER NEAR BON WIER, TEX.

LOCATION.—Chain gage on Gulf, Colorado & Santa Fe Railway bridge 1¼ miles east of Bon Wier, Newton County. Zero of gage, 45.4 feet above mean sea level.

DRAINAGE AREA.—8,390 square miles.

RECORDS AVAILABLE.—October, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, 41,400 second-feet Mar. 26 (gage height, 20.3 feet); minimum, 440 second-feet Oct. 6–13 (gage height, 0.88 foot).

1923–1929: Maximum discharge, about 45,600 second-feet Apr. 21, 1927 (gage height, 2.06 feet); minimum, 185 second-feet Sept. 11, 22, and 24, 1925 (gage height, 0.50 foot).

REMARKS.—Monthly records fair. Records of daily discharge not sufficiently accurate for publication. No diversions. Gage-height record furnished by United States Weather Bureau.

Monthly discharge, in second-feet, 1928–29

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	770	440	564	34,700
November	3,320	575	1,540	91,607
December	9,370	930	4,540	279,040
January	16,500	7,940	12,000	738,000
February	15,100	7,160	11,500	639,000
March	40,000	7,550	16,800	1,030,000
April	12,800	4,040	6,810	405,000
May	29,000	6,020	13,900	855,000
June	40,000	3,320	17,200	1,020,000
July	3,620	1,150	1,940	119,000
August	1,550	610	934	57,400
September	1,200	540	861	51,200
The year	40,000	440	7,360	5,320,000

Digitized by Google

SABINE RIVER NEAR RULIFF, TEX.

LOCATION.—Staff gage on Kansas City Southern Railway bridge, 1½ miles east of Ruliff, Newton County, and 5 miles below the mouth of Cypress Creek. Zero of gage, 4.7 feet above mean sea level.

DRAINAGE AREA.—9,450 square miles.

RECORDS AVAILABLE.—October, 1924, to September, 1929.

EXTREMES.—Maximum discharge during year, about 61,200 second-feet June 1 (gage height, 14.4 feet); minimum, 476 second-feet Oct. 3 and 7–11 (gage height, 1.80 feet).

1924–1929: Maximum discharge, that of June 1, 1929; minimum, 372 second-feet Sept. 11, 1925 (gage height, 1.10 feet).

The river reached a stage of 15.5 feet Apr. 15, 1923.

REMARKS.—Records fair. No diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	505	622	1,160	9,580	11,100	11,100	25,200	7,450	61,200	7,050	1,360	714
2	505	652	1,160	9,580	11,100	11,800	21,800	7,680	52,200	4,850	1,310	683
3	476	652	1,160	9,580	11,100	13,000	17,100	7,900	38,700	3,650	1,310	683
4	505	652	1,200	9,300	11,400	13,500	15,100	8,350	34,200	2,960	1,310	683
5	505	683	1,240	9,850	11,800	14,000	13,000	8,800	29,700	2,700	1,270	683
6	505	809	1,310	9,850	12,600	13,500	11,100	8,800	27,400	2,550	1,240	683
7	476	910	1,500	10,400	13,500	12,600	8,800	8,350	25,200	2,480	1,200	652
8	476	1,020	1,610	10,800	13,500	11,800	7,450	7,900	21,800	2,480	1,160	652
9	476	1,160	1,840	11,100	14,000	11,100	6,460	7,050	19,200	2,700	1,090	652
10	476	1,610	1,900	12,200	14,000	11,100	5,600	6,650	19,200	2,780	1,020	745
11	476	2,400	1,840	12,200	14,000	10,400	6,080	6,460	17,100	2,780	945	1,050
12	505	2,870	1,780	12,200	13,500	9,850	7,050	6,260	15,700	2,700	945	1,120
13	534	2,960	1,720	12,600	12,600	9,300	8,350	6,260	14,500	2,550	910	1,020
14	534	2,870	2,100	12,600	12,600	8,800	9,300	6,650	13,500	2,550	945	945
15	534	2,700	2,550	13,000	13,000	8,350	9,580	6,650	13,500	2,400	910	945
16	563	2,550	2,780	13,500	13,000	7,900	9,300	7,450	12,600	2,250	945	945
17	622	2,400	2,870	14,000	13,000	8,800	8,350	9,300	12,600	2,040	1,090	945
18	683	2,320	3,350	14,500	13,500	9,850	7,450	11,800	12,200	1,970	1,120	980
19	745	2,250	3,900	15,700	13,500	11,800	7,050	14,000	12,600	2,100	1,050	945
20	809	2,100	4,560	15,700	13,500	13,500	6,650	14,500	13,000	2,250	980	1,020
21	876	1,840	5,450	16,400	14,000	14,500	6,460	17,100	13,000	2,250	945	1,160
22	876	1,670	6,260	15,700	14,000	15,700	6,260	19,200	12,600	2,180	876	1,310
23	842	1,500	6,650	15,700	13,500	19,200	6,260	20,500	12,600	1,970	809	1,360
24	809	1,310	7,450	15,100	12,600	21,800	6,080	20,500	12,600	1,780	809	1,400
25	714	1,240	7,900	14,500	11,800	29,700	5,910	19,200	12,200	1,610	745	1,400
26	683	1,160	8,120	13,500	11,100	38,700	5,760	19,200	12,200	1,560	745	1,360
27	683	1,120	8,350	12,600	11,100	38,700	5,600	18,200	11,800	1,450	745	1,270
28	683	1,120	8,580	11,800	10,800	36,400	5,450	17,100	11,400	1,360	745	1,160
29	652	1,160	8,800	11,400	-------	34,200	6,260	18,200	11,100	1,310	777	1,120
30	622	1,160	9,050	11,100	-------	29,700	7,050	23,500	9,580	1,310	745	1,050
31	622	-------	9,300	11,100	-------	27,400	-------	43,200	-------	1,310	714	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	876	476	612	37,600
November	2,960	622	1,580	94,000
December	9,300	1,160	4,110	253,000
January	16,400	9,300	12,500	769,000
February	14,000	10,800	12,700	705,000
March	38,700	7,900	17,000	1,050,000
April	25,200	5,450	9,060	539,000
May	43,200	6,260	13,000	799,000
June	61,200	9,580	19,500	1,160,000
July	7,050	1,310	2,450	151,000
August	1,360	714	992	61,000
September	1,400	652	978	58,200
The year	61,200	476	7,840	5,680,000

Digitized by Google

NECHES RIVER BASIN

NECHES RIVER NEAR ROCKLAND, TEX.

LOCATION.—Staff gage half a mile above Texas & New Orleans Railroad bridge 1 mile north of Rockland, Tyler County. Zero of gage, 95.50 feet above mean sea level.

DRAINAGE AREA.—3,540 square miles.

RECORDS AVAILABLE.—October, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, 34,200 second-feet June 1 (gage height, 26.80 feet); minimum, 21 second-feet Oct. 3–5 (gage height, −0.80 foot).

1923–1929: Maximum discharge, that of June 1, 1929; minimum, 7.0 second-feet Aug. 23 and 24, 1925 (gage height, −1.2 feet).

Highest stage recorded, 28.9 feet by United States Weather Bureau, Apr 2, 1922 (discharge, about 45,800 second-feet).

REMARKS.—Records fair. No diversions above gage. Gage-height record furnished by United States Weather Bureau.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30	40	275	1,270	2,400	2,160	3,150	1,640	34,200	726	201	50
2	30	136	350	1,350	2,890	1,980	2,830	1,680	33,100	576	201	50
3	21	119	350	1,390	3,490	1,850	2,680	1,720	28,200	576	182	40
4	21	74	378	1,470	3,430	1,850	2,540	1,760	21,800	1,190	182	40
5	21	74	378	2,120	3,370	2,260	2,440	1,760	16,900	1,680	163	40
6	30	74	350	2,260	4,160	1,850	2,400	1,760	14,500	2,120	163	40
7	30	74	350	2,210	4,030	1,720	2,260	1,720	13,300	1,850	136	40
8	30	191	378	2,210	3,900	1,640	2,120	1,590	12,000	1,720	136	50
9	30	378	378	2,300	3,780	1,550	2,780	1,390	10,900	1,590	119	50
10	30	438	407	2,730	3,550	1,470	2,780	1,110	9,830	1,190	119	40
11	40	470	438	2,830	3,200	1,420	2,350	1,110	8,850	957	103	50
12	40	504	470	2,780	2,990	1,420	2,080	1,270	7,940	726	88	50
13	40	504	879	2,730	2,730	2,830	1,760	3,110	7,100	650	88	40
14	40	540	1,150	2,680	2,440	3,780	1,980	9,900	7,100	576	74	191
15	40	540	1,150	2,680	2,350	3,490	2,080	12,100	7,660	504	74	154
16	40	540	840	2,730	2,490	3,150	2,080	14,300	6,920	438	74	136
17	50	540	764	2,540	2,490	2,940	2,120	14,500	5,710	378	74	232
18	61	540	688	2,300	2,400	2,780	2,080	14,000	4,690	378	61	211
19	50	540	650	2,260	2,300	2,640	1,900	17,200	3,780	378	61	136
20	50	540	650	2,210	2,210	2,540	1,640	13,700	3,310	310	61	88
21	50	504	688	2,160	2,120	2,440	1,550	13,600	2,990	286	61	74
22	50	470	764	2,120	1,980	3,310	1,470	13,000	2,780	264	61	61
23	50	407	802	2,080	1,940	4,820	1,470	12,300	2,590	264	50	74
24	50	350	879	2,080	1,900	4,960	1,420	11,500	2,490	264	50	119
25	50	323	918	2,120	1,850	5,230	1,350	10,700	2,300	222	50	136
26	50	298	957	2,160	2,640	5,500	1,270	9,690	2,120	201	61	154
27	50	253	996	2,210	2,540	5,230	1,270	8,920	2,030	201	61	136
28	40	253	1,040	2,210	2,350	4,960	1,230	14,000	1,640	182	50	136
29	40	253	1,070	2,260	------	4,550	1,230	24,100	1,420	182	50	119
30	40	253	1,150	2,300	------	4,160	1,350	27,100	957	182	50	103
31	40	------	1,230	2,350	------	3,550	------	30,900	------	201	50	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	61	21	39.8	2,450
November	540	40	341	20,300
December	1,230	275	702	43,200
January	2,830	1,270	2,230	137,000
February	4,160	1,850	2,780	154,000
March	5,500	1,420	3,030	186,000
April	3,150	1,230	1,990	118,000
May	30,900	1,110	9,460	582,000
June	34,200	957	9,300	553,000
July	2,120	182	676	41,600
August	201	50	95.8	5,880
September	232	40	94.7	5,640
The year	34,200	21	2,560	1,850,000

Digitized by Google

NECHES RIVER AT EVADALE, TEX.

LOCATION.—Staff gage at Gulf, Colorado & Santa Fe Railway bridge at Evadale, Casper County. Zero of gage, 7.20 feet above mean sea level.

DRAINAGE AREA.—7,910 square miles.

RECORDS AVAILABLE.—July, 1904, to December, 1906, and October, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, 67,600 second-feet June 1 (gage height, 22.20 feet); minimum, 255 second-feet Oct. 9 (gage height, −0.04 foot).

1904–1906, 1923–1929: Maximum discharge, that of June 1, 1929; minimum, about 148 second-feet Sept. 10, 1925.

Maximum stage known, 33.4 feet in 1884 from records of Gulf, Colorado & Santa Fe Railway.

REMARKS.—Records fair. No diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	267	319	797	3,460	6,100	7,750	14,400	4,290	67,600	4,050	1,460	471
2	267	348	797	3,390	6,100	8,070	12,500	4,290	66,000	3,600	1,570	471
3	267	333	826	3,460	6,100	7,750	10,800	4,620	64,400	2,730	1,460	451
4	279	348	884	3,530	6,590	7,130	9,180	4,920	62,000	2,510	1,220	451
5	267	414	1,040	4,130	7,430	6,590	7,750	5,120	59,600	2,400	1,080	432
6	255	432	1,380	4,720	8,400	6,590	6,990	5,120	61,200	2,460	1,010	432
7	255	432	1,500	5,740	8,770	7,130	6,220	5,020	55,600	3,100	914	432
8	255	414	1,460	6,460	9,180	7,280	5,740	4,920	51,600	4,370	884	432
9	255	513	1,380	6,850	9,600	6,850	5,620	4,820	48,400	5,220	855	432
10	267	633	1,260	6,850	9,810	5,980	5,740	4,540	43,600	5,320	826	414
11	267	633	1,150	6,720	9,810	5,320	6,850	4,050	38,900	5,220	797	414
12	267	713	1,110	6,850	9,390	4,820	7,910	3,320	35,800	4,820	768	432
13	255	797	1,260	7,130	8,970	4,720	8,400	3,010	31,900	4,210	740	492
14	267	884	1,340	7,130	8,400	5,120	7,750	3,840	28,700	3,530	713	659
15	267	977	1,530	7,130	8,400	6,460	6,850	6,640	26,400	2,900	686	797
16	279	1,080	2,110	7,130	8,070	7,910	5,980	10,500	23,500	2,460	659	855
17	292	1,220	2,730	7,130	8,070	9,180	5,520	14,900	21,400	2,200	633	884
18	279	1,300	3,060	7,280	8,070	9,600	5,220	20,600	19,200	2,060	633	945
19	292	1,420	3,260	7,280	7,910	9,600	5,120	24,200	17,900	1,970	607	1,010
20	333	1,420	3,260	6,850	7,590	8,770	5,020	26,400	14,900	1,830	607	1,080
21	380	1,380	3,060	6,460	7,130	8,400	4,820	28,000	12,500	1,650	558	884
22	364	1,340	2,950	6,100	6,720	9,600	4,620	30,300	11,600	1,610	558	768
23	348	1,300	2,900	5,980	6,460	10,300	4,370	31,900	10,800	1,530	558	713
24	333	1,260	2,900	5,860	6,220	11,800	4,130	32,600	9,390	1,460	558	659
25	348	1,190	2,900	5,740	6,100	14,000	3,960	31,900	8,230	1,460	558	607
26	364	1,080	3,010	5,620	5,860	15,400	3,800	31,900	7,590	1,420	535	582
27	364	977	3,060	5,740	6,100	16,600	3,660	31,100	6,590	1,260	535	558
28	333	914	3,190	5,860	6,990	17,200	3,730	31,900	5,740	1,190	513	558
29	333	826	3,320	5,860	-------	17,200	4,130	36,500	5,020	1,150	513	558
30	333	826	3,390	6,100	-------	16,600	4,370	48,400	4,540	1,190	492	558
31	333	-------	3,460	6,220	-------	16,000	-------	63,600	-------	1,300	492	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	380	255	299	18,400
November	1,420	319	857	51,000
December	3,460	797	2,140	132,000
January	7,280	3,390	5,960	366,000
February	9,810	5,860	7,650	425,000
March	17,200	4,720	9,540	587,000
April	14,400	3,660	6,370	379,000
May	63,600	3,010	18,200	1,120,000
June	67,600	4,540	30,700	1,830,000
July	5,320	1,150	2,650	163,000
August	1,570	492	774	47,600
September	1,080	414	614	36,500
The year	67,600	255	7,110	5,160,000

Digitized by Google

ANGELINA RIVER NEAR LUFKIN, TEX.

LOCATION.—Chain gage on highway bridge, 1 mile above Houston East & West Texas Railway bridge, and 8 miles north of Lufkin, Angelina County.

DRAINAGE AREA.—1,580 square miles.

RECORDS AVAILABLE.—October, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, 8,160 second-feet May 31 (gage height, 13.06 feet); minimum, 10 second-feet Oct. 2 and 3 (gage height, 1.72 feet).

1923–1929: Maximum discharge, about 30,200 second-feet Nov. 19–21, 1925 (gage height, 15.99 feet from gage on railroad bridge 1 mile downstream); minimum, that of Oct. 2 and 3, 1928.

REMARKS.—Records fair. No diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	41	330	2,860	2,200	1,400	1,040	1,720	6,880	242	77	17
2	10	56	300	2,300	2,400	1,340	930	1,520	5,450	224	86	16
3	10	90	290	1,860	2,400	1,340	830	1,100	4,260	391	90	15
4	11	118	290	1,400	2,400	1,340	780	830	3,640	640	68	15
5	11	197	300	1,340	2,300	1,340	680	680	3,460	730	54	15
6	12	310	310	1,340	2,300	1,340	640	520	3,840	640	50	15
7	12	385	320	1,340	2,100	1,340	600	415	4,490	450	46	15
8	13	485	330	1,400	1,940	1,220	560	350	4,710	350	42	16
9	14	520	340	1,460	1,940	1,160	560	385	4,950	340	38	16
10	15	560	365	1,580	1,790	1,160	640	600	4,710	365	34	16
11	22	560	415	1,650	1,860	1,220	780	640	4,260	365	32	18
12	32	600	520	1,720	1,790	1,340	880	560	3,840	365	29	16
13	36	640	730	1,860	1,720	1,720	980	1,160	3,460	350	28	15
14	34	640	780	2,020	1,650	2,020	1,100	2,200	3,140	330	28	28
15	34	640	680	2,200	1,650	2,100	1,220	2,100	2,730	290	28	148
16	32	600	640	2,400	1,650	2,020	1,280	1,940	2,400	242	26	197
17	38	520	680	2,500	1,650	1,860	1,220	1,790	2,100	206	26	172
18	56	365	980	2,600	1,650	1,790	1,100	1,790	1,790	172	28	125
19	58	300	1,160	2,600	1,650	1,720	980	2,200	1,400	156	24	97
20	46	242	1,280	2,500	1,650	1,790	930	2,400	930	140	22	90
21	41	215	1,340	2,300	1,580	2,100	880	2,500	600	125	20	90
22	40	197	1,400	2,100	1,520	2,400	830	2,200	415	111	18	80
23	38	188	1,520	1,940	1,400	2,400	730	1,790	365	97	18	68
24	40	188	1,720	1,790	1,340	2,400	730	1,580	340	83	19	56
25	36	188	2,100	1,940	1,280	2,300	930	1,460	320	77	23	46
26	34	197	2,300	1,940	1,340	2,200	1,040	1,720	300	74	24	40
27	29	206	2,730	2,020	1,460	2,020	1,160	2,020	290	68	23	35
28	28	206	3,290	2,100	1,520	1,860	1,220	2,020	270	64	22	32
29	29	206	3,640	2,100	------	1,720	1,040	3,520	260	58	23	29
30	34	340	3,640	2,200	------	1,460	1,220	6,000	251	56	22	28
31	35	------	3,290	2,200	------	1,280	------	8,160	------	64	19	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	58	10	28.7	1,760
November	640	41	333	19,800
December	3,640	290	1,230	75,600
January	2,860	1,340	1,990	122,000
February	2,400	1,280	1,790	99,400
March	2,400	1,160	1,700	105,000
April	1,280	560	917	54,600
May	8,160	350	1,870	115,000
June	6,880	251	2,530	151,000
July	730	56	254	15,600
August	90	18	35.1	2,160
September	197	15	52.2	3,110
The year	8,160	10	1,050	765,000

Digitized by Google

ANGELINA RIVER AT HORGER, TEX.

LOCATION.—Chain gage on Zavalla-Jasper highway bridge one-fourth mile east of Horger, Jasper County, and about 20 miles above mouth.

DRAINAGE AREA.—3,440 square miles.

RECORDS AVAILABLE.—March, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 33,300 second-feet May 30 (gage height, 34.50 feet); minimum, 46 second-feet Oct. 4 (gage height, 1.28 feet).

1928–29.—Maximum discharge, that of May 30, 1929; minimum, 46 second-feet Sept. 9, 15, 20, and Oct. 4, 1928.

Maximum stage known, about 39.50 feet in August, 1914.

REMARKS.—Records fair. No diversions above station. May be backwater at times from Neches River, 20 miles below.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	51	83	322	2,060	3,530	4,110	3,630	2,810	29,800	906	396	72
2	49	96	365	2,290	4,400	3,440	3,240	2,810	27,600	834	307	67
3	48	89	427	3,000	4,600	3,050	2,910	2,760	25,500	834	267	65
4	48	89	620	3,240	4,500	3,580	2,670	2,670	23,300	906	254	65
5	53	110	1,010	3,530	4,500	3,960	2,570	2,570	21,400	1,830	254	62
6	52	380	978	3,580	4,650	3,580	2,290	2,520	19,500	2,480	254	59
7	49	427	942	3,630	4,900	2,860	1,830	2,380	17,700	2,860	242	55
8	54	380	906	3,530	4,650	2,570	1,740	1,880	15,900	2,760	254	54
9	58	336	554	3,580	4,300	2,290	2,860	1,740	14,200	2,570	242	52
10	58	294	490	3,630	4,110	2,100	3,960	1,300	12,200	2,200	198	55
11	55	230	522	3,680	3,960	1,970	3,720	1,050	10,600	1,780	177	89
12	53	396	490	3,290	3,770	2,570	2,480	1,220	9,000	1,300	141	280
13	52	490	587	3,050	3,680	3,820	2,010	5,800	7,520	1,130	141	427
14	50	522	798	3,000	3,480	5,050	1,700	8,370	6,770	1,050	149	280
15	52	554	1,740	2,810	3,530	5,450	1,740	10,200	6,540	942	149	254
16	55	587	2,200	2,620	3,770	4,600	1,920	12,300	6,110	870	149	254
17	89	620	2,200	2,620	3,630	4,110	2,060	11,900	5,600	762	96	230
18	158	620	2,060	2,570	3,440	3,870	1,920	12,000	5,000	726	77	208
19	117	620	1,880	2,520	3,150	3,720	1,830	12,600	4,700	620	77	208
20	102	620	1,780	2,570	3,150	4,200	1,780	12,900	4,400	554	77	198
21	117	620	1,880	2,670	2,960	5,100	1,740	13,500	3,820	522	83	198
22	187	587	1,920	2,760	3,050	5,700	1,740	13,100	3,440	490	125	208
23	187	554	1,970	2,760	3,340	8,280	1,740	12,500	3,000	458	117	198
24	133	490	2,010	2,720	3,480	10,100	1,650	10,600	2,480	427	110	187
25	125	380	2,100	2,860	3,630	10,600	1,470	9,090	1,920	427	110	267
26	117	336	2,150	3,200	4,110	8,910	1,700	8,280	1,470	365	102	149
27	125	336	2,200	3,340	4,650	7,200	2,670	9,460	1,300	350	102	141
28	110	365	2,240	3,390	4,550	5,900	2,670	18,600	1,180	390	96	125
29	102	280	2,240	3,290	-------	5,050	2,290	27,000	1,050	396	89	110
30	89	294	2,150	3,150	-------	4,450	2,150	33,300	978	380	89	102
31	83	-------	2,100	3,050	-------	4,060	-------	32,000	-------	380	89	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	187	48	86.4	5,310
November	620	83	393	23,400
December	2,240	322	1,410	86,700
January	3,680	2,060	3,030	186,000
February	4,900	2,960	3,910	217,000
March	10,600	1,970	4,720	290,000
April	3,960	1,470	2,290	136,000
May	33,300	1,050	9,650	593,000
June	29,800	978	9,800	583,000
July	2,860	350	1,050	64,600
August	396	77	162	9,960
September	427	52	157	9,340
The year	33,300	48	3,050	2,200,000

Digitized by Google

TRINITY RIVER BASIN

WEST FORK OF TRINITY RIVER AT BRIDGEPORT, TEX.

LOCATION.—Staff gage at Chicago, Rock Island & Gulf Railway Co.'s pumping plant half a mile southwest of Bridgeport, Wise County.

DRAINAGE AREA.—1,010 square miles.

RECORDS AVAILABLE.—October, 1914, to September, 1929.

EXTREMES.—Maximum discharge during year, 5,550 second-feet May 16 (gage height, 19.80 feet); no flow during several periods.

1914–1929: Maximum discharge not determined (gage height, 28.9 feet June 8, 1915); no flow during several periods.

REMARKS.—Records fair. Small amount of water diverted above station for water supply of Bridgeport.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	695	5.8	6.4	9.0	13	7.1	23	1,260	1.4	1.2	0
2	0	642	4.5	5.2	11	11	6.4	9.7	962	2.9	.2	0
3	0	591	4.5	4.5	13	12	5.8	7.8	319	11	.1	0
4	0	319	4.5	31	11	11	5.8	5.2	105	5.2	0	0
5	0	84	4.2	902	10	10	4.5	3.7	164	4.0	0	0
6	0	43	4.0	840	11	9.7	4.2	3.7	455	2.9	0	0
7	0	16	4.2	630	12	9.0	4.2	2.9	902	2.1	0	0
8	0	16	1.8	144	12	9.0	6.4	2.6	779	2.6	0	291
9	0	10	1.4	77	9.7	8.4	91	2.6	616	2.3	0	269
10	0	8.4	1.3	52	8.4	8.4	11	10	285	1.7	0	156
11	0	7.1	2.9	32	5.8	9.0	5.2	3.2	91	1.3	0	520
12	0	4.5	44	22	6.4	50	4.0	77	48	.1	0	1,020
13	0	4.0	131	19	13	45	3.4	3,510	28	.2	0	1,170
14	0	4.2	68	17	13	229	3.4	3,680	23	.2	0	1,020
15	0	59	72	15	12	198	11	3,260	17	0	0	580
16	0	285	70	10	10	91	8.4	4,810	10	0	0	81
17	0	201	228	10	9.0	52	7.1	2,390	8.4	0	0	23
18	0	136	74	9.7	9.0	34	4.5	2,340	5.8	0	0	11
19	0	136	61	10	8.4	26	4.2	1,690	5.8	0	0	6.4
20	0	81	50	9.0	8.4	19	8.4	434	5.8	38	0	4.5
21	0	39	39	8.4	9.0	18	3.7	515	4.2	6.4	0	3.2
22	0	23	30	8.4	10	17	3.2	189	4.2	1.3	0	1.8
23	0	18	23	13	9.0	16	27	110	2.9	136	0	1.7
24	0	16	18	115	8.4	11	11	100	2.9	70	0	1.6
25	0	13	13	45	7.8	8.4	7.1	239	2.3	17	0	1.2
26	0	11	11	18	17	8.4	8.2	81	2.3	9.0	0	.8
27	0	11	11	16	11	7.1	384	70	2.3	3.7	0	.5
28	266	9.7	10	15	13	7.8	616	52	1.6	2.1	0	.2
29	337	8.4	9.7	11	-------	8.4	282	34	1.4	2.3	0	.1
30	779	7.1	8.4	10	-------	7.8	54	2,070	1.7	2.3	0	0
31	520	-------	7.1	9.7	-------	7.8	-------	2,890	---------	1.8	0	--------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	779	0	61.4	3,780
November	695	4.0	117	6,960
December	228	1.3	32.8	2,020
January	902	4.5	100	6,150
February	17	5.8	10.3	572
March	229	7.1	31.4	1,930
April	616	3.2	53.4	3,180
May	4,810	2.6	923	56,800
June	1,260	1.4	204	12,100
July	136	0	10.6	652
August	1.2	0	.05	3.1
September	1,170	0	172	10,200
The year	4,810	0	144	104,000

Digitized by Google

WEST FORK OF TRINITY RIVER AT LAKE WORTH DAM, ABOVE FORT WORTH, TEX.

LOCATION.—Water-stage recorder just above Lake Worth Dam, 4½ miles northwest of Tarrant County courthouse in Fort Worth.
DRAINAGE AREA.—1,870 square miles.
RECORDS AVAILABLE.—October, 1923, to September, 1929.
EXTREMES.—Maximum discharge during year, 7,120 second-feet May 17 (gage height, 2.13 feet); no flow during several periods.
1923–1929: Maximum discharge, 7,600 second-feet Nov. 18, 1923 (gage height, 2.25 feet); no flow during several periods.
REMARKS.—Records fair. Diversions for municipal use only; amount not known.

Daily and monthly discharge, in second-feet, 1928–29

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Sept.
1	2.8	14	14	78	*110	22	451	1,420	0
2	113	14	3.2	70	78	17	190	1,990	0
3	339	9.2	2.4	70	94	17	70	2,400	0
4	475	9.2	6.8	70	94	14.0	46	2,720	0
5	513	2.4	30	70	54	9.2	27	2,580	0
6	494	.8	12	62	54	3.2	30	1,460	0
7	318	.8	231	62	46	9.2	22	834	0
8	202	0	735	70	38	53	20	759	0
9	144	0	1,080	54	54	960	17	834	0
10	102	1.6	664	54	27	976	9.2	972	0
11	78	6.6	349	46	30	494	6.6	944	0
12	70	20	214	54	144	318	19	664	0
13	46	46	179	54	190	225	420	418	0
14	54	122	133	54	202	202	1,560	272	0
15	54	214	133	70	190	168	1,920	190	0
16	54	579	94	46	202	110	2,820	144	0
17	86	1,120	78	38	240	102	5,500	122	.7
18	86	617	94	54	225	94	5,590	110	22
19	122	513	54	62	190	86	6,410	102	38
20	122	334	46	54	168	110	6,410	102	30
21	110	214	27	70	144	94	5,110	86	25
22	102	156	30	70	133	70	4,080	46	20
23	78	122	152	62	102	38	3,320	12	14
24	70	102	402		62	78	2,080	17	6.6
25	54	86	437		78	78	*1,030	17	2.4
26	30	86	437	*165	70	38	*759	12	0
27	38	70	399		54	30	688	4.0	0
28	30	54	225		62	38	513	2.4	0
29	38	38	156	-------	38	70	418	0	0
30	25	22	133	-------	25	240	724	0	0
31	-------	27	110	-------	30	-------	1,260	---------	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
November	513	2.8	135	8,030
December	1,120	0	148	9,100
January	1,080	2.4	215	13,200
February	----------	----------	79.2	4,400
March	240	25	104	6,400
April	976	3.2	158	9,400
May	6,410	6.6	1,660	102,000
June	2,720	0	641	38,100
September	38	0	5.29	315
The year	6,410	0	264	191,000

* Estimated.
NOTE.—No flow during October, July, and August.

Digitized by Google

WEST FORK OF TRINITY RIVER AT FORT WORTH, TEX.

LOCATION.—Water-stage recorder in old pump house of Fort Worth Power & Light Co.'s plant in Fort Worth, Tarrant County, and 150 feet above Paddock viaduct. Zero of gage, 519.26 feet above mean sea level.

DRAINAGE AREA.—2,430 square miles.

RECORDS AVAILABLE.—October, 1920, to September, 1929.

EXTREMES.—Maximum discharge during year, 10,800 second-feet Feb. 25 (gage height, 11.80 feet, determined from floodmarks); no flow during several periods.

1920–1929: Maximum discharge, determined by slope-area method, 85,000 second-feet Apr. 25, 1922 (gage height, 23.95 feet); no flow during several periods.

REMARKS.—Monthly records fair. Daily discharge not sufficiently accurate for publication. About 15 second-feet diverted by city of Fort Worth for municipal use. Flow partly regulated at Lake Worth.

Monthly discharge, in second-feet, 1928–29

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	26	0	1.45	89
November	558	25	146	8,690
December	3,500	7.0	299	18,400
January	----------	----------	308	18,900
February	4,510	----------	354	19,700
March	----------	----------	304	18,700
April	1,960	----------	305	18,100
May	----------	----------	1,910	117,000
June	2,740	18	707	42,100
July	30	3.3	8.66	532
August	3.3	0	.64	39
September	24	0	3.61	215
The year	----------	0	363	262,000

Digitized by Google

WEST FORK OF TRINITY RIVER AT GRAND PRAIRIE, TEX.

LOCATION.—Chain gage on highway bridge on Grand Prairie-Sowers-Irving road 1 mile northeast of Grand Prairie, Dallas County. Zero of gage, 412.99 feet above mean sea level.

DRAINAGE AREA.—2,890 square miles.

RECORDS AVAILABLE.—March, 1925, to September, 1929.

EXTREMES.—Maximum discharge during year, 10,000 second-feet Dec. 17 (gage height, 25.30 feet); minimum, 12 second-feet Aug. 31 (gage height, 2.10 feet).

1925–1929: Maximum discharge, that of Dec. 17, 1928; minimum, 3.2 second-feet June 6, 1925.

During April, 1922, a stage of about 29 feet was reached.

REMARKS.—Records fair. Discharge interpolated Oct. 4 and 5. Numerous small diversions above gage; amount not known. Largest diversion of about 15 second-feet is made by city of Fort Worth. Flow partly regulated by storage at Lake Worth.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	65	73	103	276	771	165	232	3,840	43	23	15
2	19	109	66	121	191	581	178	405	2,290	44	26	16
3	21	139	48	91	232	473	139	356	2,110	57	26	14
4	22	315	36	80	232	422	158	152	2,440	62	23	14
5	24	456	35	158	232	405	146	109	2,770	51	22	22
6	25	545	34	324	218	356	133	109	2,830	47	19	31
7	19	509	36	218	218	308	127	91	1,760	19	20	31
8	18	324	30	191	218	276	158	103	1,160	50	20	418
9	20	246	33	858	232	261	886	103	1,020	53	20	280
10	21	178	71	1,220	178	246	2,060	97	1,080	41	19	42
11	20	133	65	923	165	246	1,330	176	1,120	41	18	31
12	18	83	231	563	218	574	714	91	1,060	38	18	21
13	19	68	847	356	246	2,030	473	228	828	34	16	22
14	20	90	372	246	246	923	372	1,190	581	36	18	149
15	20	694	232	204	204	657	292	1,910	372	33	18	38
16	17	386	178	204	204	581	324	2,210	232	29	18	22
17	17	121	6,920	152	204	509	204	3,100	178	29	18	15
18	18	127	7,780	127	158	527	165	4,330	139	25	18	16
19	19	97	2,180	127	165	509	178	5,220	121	34	15	15
20	20	146	885	127	191	456	915	5,440	115	36	14	18
21	17	152	676	103	261	439	834	5,910	91	33	14	20
22	23	152	456	103	388	473	261	5,710	97	32	15	40
23	39	139	372	103	388	388	158	4,470	91	25	15	41
24	42	115	276	1,430	276	340	158	3,350	80	29	13	30
25	44	97	232	1,320	3,040	246	962	2,380	75	20	15	30
26	48	85	191	847	6,890	232	356	1,710	75	22	19	23
27	68	67	165	676	2,160	246	178	1,300	69	32	14	20
28	75	75	139	600	885	218	139	980	66	28	14	18
29	91	77	133	422	------	232	127	904	59	29	14	18
30	62	57	121	308	------	204	127	1,450	35	24	15	18
31	62	------	103	292	------	178	------	3,350	------	21	12	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	91	17	31.4	1,930
November	694	57	195	11,600
December	7,780	30	742	45,600
January	1,430	80	406	25,000
February	6,890	158	661	36,700
March	2,030	178	462	28,400
April	2,060	127	414	24,600
May	5,910	91	1,840	113,000
June	3,840	35	893	53,100
July	62	19	35.4	2,180
August	26	12	17.7	1,090
September	418	14	49.6	2,950
The year	7,780	12	479	346,000

Digitized by Google

TRINITY RIVER AT DALLAS, TEX.

LOCATION.—Chain gage on Commerce Street viaduct in Dallas, Dallas County. Zero of gage, 368.05 feet above mean sea level.

DRAINAGE AREA.—6,000 square miles.

RECORDS AVAILABLE.—October, 1898, to December, 1899; July, 1903, to December, 1906; and October, 1920, to September, 1929.

EXTREMES.—Maximum discharge during year, 34,800 second-feet Dec. 18 (gage height, 37.20 feet); minimum, 17 second-feet Oct. 1 (gage height, 4.69 feet).

1898–99, 1903–1906, 1920–1929: Maximum discharge, 75,100 second-feet Apr. 27, 1922 (gage height, 42.35 feet); minimum, 6.8 second-feet Sept. 11, 1924 (gage height, 4.27 feet).

Maximum flood, from United States Weather Bureau records, 52.6 feet May 26, 1908. During 1917–18 the discharge was practically zero.

REMARKS.—Records fair. Only known diversions are for municipal uses. Low-water flow partly regulated by dams upstream. Gage-height record furnished by United States Weather Bureau.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17	339	107	152	557	1,990	503	467	11,400	132	19	82
2	20	797	88	246	431	1,190	503	597	10,200	132	26	74
3	58	246	107	302	413	1,020	467	777	8,450	142	252	82
4	47	183	99	272	503	675	347	503	6,900	162	400	118
5	24	449	85	1,440	521	347	449	395	6,460	172	40	183
6	34	557	92	1,370	413	677	449	287	6,900	142	40	115
7	26	577	85	757	207	657	449	272	6,680	152	34	123
8	22	503	85	521	449	597	637	272	6,180	123	34	298
9	18	377	78	1,270	413	521	2,560	1,350	3,170	123	44	982
10	18	272	71	1,870	431	521	5,200	1,570	1,420	207	34	235
11	20	194	123	1,390	332	677	3,150	1,040	1,390	88	40	123
12	20	162	272	949	332	1,590	1,600	822	1,420	44	40	107
13	20	132	3,630	697	449	5,300	1,020	4,470	1,900	40	40	228
14	172	172	2,270	503	449	3,720	797	8,080	2,050	40	30	697
15	123	400	617	449	485	1,960	757	10,800	1,930	27	26	467
16	115	1,810	1,150	395	485	1,360	697	15,000	930	27	30	220
17	115	363	19,800	431	395	1,120	637	19,200	521	27	30	183
18	107	194	32,800	377	377	1,060	503	18,600	431	19	34	246
19	107	183	18,100	317	272	1,020	485	16,800	413	31	40	377
20	107	142	7,140	377	317	1,040	2,970	16,500	362	23	40	395
21	107	233	3,310	332	485	1,220	5,580	15,500	272	31	50	395
22	132	194	1,220	259	797	1,160	1,450	14,500	259	34	44	317
23	115	183	697	408	861	971	637	12,700	233	34	55	413
24	107	172	557	5,570	657	797	597	9,800	207	27	44	395
25	132	142	485	7,020	2,840	737	3,050	7,260	162	27	44	377
26	132	142	395	4,400	10,700	647	3,640	6,460	152	27	44	377
27	123	142	347	2,020	11,000	697	829	7,250	162	27	61	377
28	172	123	302	1,190	4,570	617	521	5,500	142	34	74	259
29	449	123	259	927	-------	597	503	6,570	132	34	74	233
30	362	115	259	737	-------	577	503	6,570	132	31	74	467
31	183	-------	233	597	-------	503	-------	9,810	-------	23	74	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	449	17	103	6,330
November	1,810	115	321	19,100
December	32,800	71	3,060	188,000
January	7,020	152	1,210	74,400
February	11,000	207	1,430	79,400
March	5,300	347	1,150	70,700
April	5,580	347	1,380	82,100
May	19,200	272	7,090	436,000
June	11,400	132	2,700	161,000
July	207	19	70.4	4,330
August	400	19	61.6	3,790
September	982	74	298	17,700
The year	32,800	17	1,580	1,140,000

Digitized by Google

TRINITY RIVER NEAR OAKWOOD, TEX.

LOCATION.—Chain gage on International-Great Northern Railroad bridge 4 miles northeast of Oakwood, Anderson County.

DRAINAGE AREA.—12,800 square miles.

RECORDS AVAILABLE.—October, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, 68,000 second-feet June 3 (gage height, 45.18 feet); minimum, 62 second-feet Oct. 2 and 3 (gage height, 3.5 feet).

1923–1929: Maximum discharge, that of June 3, 1929; minimum, probably less than 28 second-feet in August, 1925.

On June 4, 1908, river reached stage of about 53.5 feet.

REMARKS.—Monthly records fair. Daily-discharge record not sufficiently accurate for publication. No diversions above station. Gage-height record furnished by United States Weather Bureau.

Monthly discharge, in second-feet, 1928–29

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	198	62	105	6,460
November	1,630	310	763	45,400
December	20,300		7,590	467,000
January	15,300	1,440	6,960	428,000
February	12,000	1,580	3,120	173,000
March	11,300	1,800	5,810	357,000
April	10,900	1,210	4,820	287,000
May	46,500	962	13,800	848,000
June	68,000	820	22,700	1,350,000
July	1,950	146	530	32,600
August	265	92	124	7,620
September	3,490	105	643	38,300
The year	68,000	62	5,580	4,040,000

TRINITY RIVER AT RIVERSIDE, TEX.

LOCATION.—Chain gage on International-Great Northern Railroad bridge at Riverside, Walker County. Zero of gage, 93.7 feet above mean sea level.

DRAINAGE AREA.—15,500 square miles.

RECORDS AVAILABLE.—January, 1903, to December, 1906; October, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, 76,100 second-feet June 1 (gage height, 46.10 feet); minimum, 85 second-feet Oct. 8, 9, 27–29 (gage height, 0.10 foot).

1903–1906, 1923–1929: Maximum discharge, that of June 1, 1929; minimum, 70 second-feet Aug. 20–26 and Sept. 8–13, 1925 (gage height, 0.2 foot).

United States Weather Bureau records show a stage of 49.7 feet (present datum) June 11, 1908.

REMARKS.—Monthly records fair. Daily-discharge record not sufficiently accurate for publication. No sizable diversions. Gage-height record furnished by United States Weather Bureau.

Monthly discharge, in second-feet, 1928–29

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	130	85	106	6,520
November	2,090	115	762	45,300
December	16,400	350	6,790	418,000
January		2,090	9,360	576,000
February	13,100	975	4,460	248,000
March	11,600	3,080	7,100	437,000
April	15,600	1,880	6,430	383,000
May	73,000	2,240	22,600	1,390,000
June	75,800	1,130	36,200	2,150,000
July	10,500	312	2,110	130,000
August	505	210	256	15,700
September	3,480	190	729	43,400
The year	75,800	85	8,070	5,840,000

Digitized by Google

TRINITY RIVER AT ROMAYOR, TEX.

LOCATION.—Chain gage on Gulf, Colorado & Santa Fe Railway bridge one-fourth mile west of Romayor, Liberty County. Gage reading indicates distance from base of rail to water surface. Zero of gage, 89.00 feet above mean sea level.

DRAINAGE AREA.—17,200 square miles

RECORDS AVAILABLE.—May, 1924, to September, 1929.

EXTREMES.—Maximum discharge during year, 81,100 second-feet May 31 (gage height, −16.30 feet); minimum not determined.

1924–1929: Maximum discharge, that of May 31, 1929; minimum, 132 second-feet Aug. 21 and 22, 1925 (gage height, −53.46 feet).

REMARKS.—Records fair. No large diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	250				10,900	5,350	3,530	12,100	64,700	1,990	830	400
2	250				12,400	5,150	3,210	14,400	61,400	1,870	910	400
3	250				14,200	6,170	3,130	15,200	59,800	1,870	870	400
4	250				14,200	7,350	3,130	14,400	59,300	2,380	710	400
5	250				13,900	8,450	2,980	11,900	57,700	4,570	520	400
6	250				13,700	9,660	2,770	8,450	55,100	8,340	490	400
7	250				11,800	10,400	2,630	4,780	54,200	10,500	490	400
8	250		918		8,890	10,900	2,490	3,210	52,800	10,400	490	400
9	250				7,020	11,100	3,530	2,490	52,000	8,120	520	400
10	262			14,300	5,860	10,100	4,390	3,640	50,600	5,650	520	400
11	262				5,150	8,450	5,150	3,560	49,800	4,210	460	400
12	275				4,950	6,060	5,960	15,200	49,500	3,450	460	400
13	275				4,300	6,990	7,130	19,700	49,500	2,840	490	400
14	275				3,770	11,400	13,200	41,300	49,500	2,420	490	400
15	275				3,610	12,600	16,800	51,100	49,100	1,930	490	400
16	275	918			3,850	12,800	16,900	53,700	48,800	1,650	490	2,610
17	275				3,530	12,400	15,900	52,800	47,700	1,350	490	3,530
18	262				3,210	12,200	14,200	49,500	46,600	1,250	400	2,630
19	262				3,130	12,500	12,000	46,600	45,000	1,250	400	2,230
20	262				3,130	12,800	9,550	44,700	41,800	1,250	400	1,650
21	262				2,980	13,000	8,010	42,200	31,800	1,300	400	1,500
22	262				2,910	17,700	6,800	40,900	19,000	1,300	400	1,350
23	262		14,300		2,980	19,200	5,150	36,700	11,200	830	400	950
24				4,570	3,050	15,600	3,850	31,700	5,960	830	400	950
25					3,050	10,500	3,130	26,100	4,390	830	400	950
26					3,450	8,120	4,740	24,700	3,530	630	400	910
27	260				4,660	6,280	7,680	25,500	3,130	555	400	1,070
28					5,250	5,350	9,330	45,600	2,910	555	400	750
29				6,060	-------	4,850	9,440	57,700	2,490	555	400	710
30				7,680	-------	4,480	9,220	54,200	2,110	555	400	670
31		-------		9,660	-------	3,940	-------	66,800	-------	670	400	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	-------	-------	261	16,000
November	-------	-------	918	54,600
December	-------	-------	7,820	481,000
January	-------	-------	10,800	664,000
February	14,200	2,910	6,420	357,000
March	19,200	3,940	9,740	599,000
April	16,900	2,490	7,200	428,000
May	66,800	2,490	29,700	1,830,000
June	64,700	2,110	37,700	2,240,000
July	10,500	555	2,770	170,000
August	910	400	494	30,400
September	3,530	400	949	56,500
The year	66,800	-------	9,570	6,930,000

Digitized by Google

CLEAR FORK OF TRINITY RIVER AT FORT WORTH, TEX.

LOCATION.—Water-stage recorder on old masonry pier 300 feet downstream from Texas & Pacific Railway bridge, 3 miles southwest of Tarrant County courthouse in Fort Worth. Zero of gage, 532.8 feet above mean sea level.

DRAINAGE AREA.—522 square miles.

RECORDS AVAILABLE.—March, 1924, to September, 1929.

EXTREMES.—Maximum discharge during year not determined (gage height, 14.90 feet Feb. 25); no flow during several periods.

1924–1929: Maximum discharge not determined (gage height 19.83 feet, Apr. 3, 1928); no flow for several periods.

REMARKS.—Monthly records fair. Practically all low flow diverted 800 feet below gage by Texas & Pacific Railway; amount not known. Low flow regulated by dam just above gage.

Daily and monthly discharge, in second-feet, 1928–29

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.4	18	46	245	66	52	721	15	1.4	0
2	12	.5	16	66	221	66	42	255	11	1.4	0
3	10	.4	18	72	185	69	36	181	9.5	1.3	0
4	5.7	.4	22	73	165	72	36	146	18	1.3	0
5	6.5	.3	57	69	139	69	34	239	16	1.1	0
6	5.7	.2	96	69	139	66	.32	149	11	1.1	0
7	6.5	.2	36	57	124	63	25	124	9.5	1.0	0
8	3.5	.1	29	63	117	142	29	100	7.5	0	0
9	2.6	.1	34	49	107	1,470	34	87	5.7	0	0
10	1.2	0	39	60	104	299	36	78	4.0	0	0
11	1.3	1.3	33	66	117	124	34	69	5.2	0	0
12	1.4	14	29	54	1,130	97	39	57	2.4	0	.1
13	1.4	68	27	31	436	104	470	46	1.8	0	.4
14	1.0	60	29	72	231	100	516	42	1.5	0	0
15	3.6	15	29	66	198	139	100	39	1.4	0	.2
16	18	1,640	25	63	169	84	132	34	1.4	0	.2
17	8.0	2,260	29	60	157	75	84	32	1.4	0	.1
18	2.1	208	34	49	161	69	165	27	1.4	0	0
19	.7	72	34	49	157	176	245	24	1.4	0	0
20	.5	46	32	60	139	266	100	22	1.3	0	0
21	.6	39	27	114	173	97	54	18	4.8	0	0
22	.6	32	32	124	153	73	46	18	5.2	0	0
23	.4	27	164	100	128	66	44	13	2.0	0	0
24	.5	25	353	97	104	276	59	15	2.2	0	0
25	.3	25	273	4,560	97	132	135	11	1.7	0	0
26	.2	25	107	462	94	69	269	10	2.8	0	0
27	.4	24	84	334	97	63	130	10	1.4	0	0
28	.2	25	75	318	94	66	69	10	1.4	0	0
29	.4	25	69	------	87	00	75	9.5	1.5	0	0
30	.4	22	63	------	87	60	1,450	10	1.4	0	0
31	------	20	57	------	78	------	2,500	------	1.4	0	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
November	18	0	3.19	190
December	2,260	0	151	9,280
January	353	16	63.5	3,900
February	4,560	46	264	14,700
March	1,130	78	182	11,200
April	1,470	60	153	9,100
May	2,500	25	228	14,000
June	721	9.5	86.5	5,150
July	18	1.3	4.91	302
August	1.4	0	.28	17
September	.4	0	.03	1.8
The year	4,560	0	93.6	67,800

NOTE.—No flow during October.

Digitized by Google

VILLAGE CREEK NEAR HANDLEY, TEX.

LOCATION.—Staff gage at Fort Worth-Webb road crossing 3½ miles south of Handley, Tarrant County.
DRAINAGE AREA.—130 square miles.
RECORDS AVAILABLE.—June, 1925, to September, 1929.
EXTREMES.—Maximum discharge during year not determined (gage height, 17.90 feet Dec. 17); no flow during several periods.
1925–1929: Maximum discharge not determined (gage height, that of Dec. 17, 1928); no flow during several periods.
REMARKS.—Monthly records fair. Daily-discharge record not sufficiently accurate for publication. No diversions above station.

Month	Maximum	Minimum	Mean	Run-off in acre-feet
November	1.8	0	0.13	7.7
December	6,050	0	246	15,100
January	111	6.5	16.0	984
February	4,300	7.5	179	9,940
March	564	7.5	38.2	2,350
April	1,050	3.9	99.9	5,940
May	466	6.9	42.9	2,640
June	98	.7	10.3	613
July	.7	0	.16	9.8
September	434	0	20.7	1,230
The year	6,050	0	53.7	38,800

NOTE.—No flow during October and August.

MOUNTAIN CREEK NEAR GRAND PRAIRIE, TEX.

LOCATION.—Water-stage recorder at Grand Prairie-Duncanville highway bridge 3½ miles southeast of Grand Prairie, Dallas County.
DRAINAGE AREA.—267 square miles.
RECORDS AVAILABLE.—March, 1925, to September, 1929.
EXTREMES.—Maximum discharge during year, determined by slope-area method, about 35,900 second-feet Dec. 17 (gage height, 21.40 feet), includes about 2,680 second-feet that is discharged through a break in levee about half a mile above gage; no flow during several periods.
1925–1929; Maximum discharge, that of Dec. 17, 1928; no flow during several periods.
REMARKS.—Low-stage records fair; high-stage records poor. Daily records not sufficiently accurate for publication. Records include flow through break in levee half a mile above gage. No diversions above station.

Month	Maximum	Minimum	Mean	Run-off in acre-feet
November	0.4	0	.04	2.4
December	13,800	0	529	32,500
January	1,110	5.6	97.8	6,010
February	869	11	83.8	4,650
March	1,100	14	106	6,520
April	3,520	5.5	286	17,000
May	1,700	13	275	16,900
June	190	----------	28.5	1,700
July	----------	0	.60	37
September	385	0	19.7	1,170
The year	13,800	0	120	86,500

NOTE.—No flow during October and August.

Digitized by Google

ELM FORK OF TRINITY RIVER NEAR CARROLLTON, TEX.

LOCATION.—Staff gage just above Carrollton Dam, 40 feet below Dallas-Denton highway bridge, and 1½ miles west of Carrollton, Dallas County.
DRAINAGE AREA.—2,540 square miles.
RECORDS AVAILABLE.—November, 1923, to September, 1929.
EXTREMES.—Maximum discharge during year, 19,000 second-feet May 15 (gage height, 9.40 feet); minimum not determined.
1923–1929: Maximum discharge not determined (gage height, 12.75 feet Dec. 14, 1923); no flow during several periods.
REMARKS.—Records fair. No diversions. Garza Dam, 20 miles upstream, regulates flow at low stages and partly regulates flow at high stages.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		572	90	129	190	231	236	236	4,990	65	8.0	58
2		153	90	137	152	218	236	227	4,080	72	9.4	58
3		72	90	133	182	165	231	208	3,460	110	149	58
4		65	90	133	190	149	231	149	2,500	114	34	58
5		62	90	402	190	137	227	141	2,900	100	34	72
6		62	93	245	186	125	227	141	2,900	100	34	62
7	16	62	96	273	174	118	227	141	2,450	100	32	62
8		62	96	199	165	118	236	141	506	100	32	72
9		62	96	250	141	125	2,860	740	303	170	32	72
10		62	118	222	114	231	1,620	962	227	96	30	65
11		62	118	195	118	245	447	447	190	27	30	79
12		62	302	174	133	960	308	1,250	708	19	32	86
13	250	62	1,490	165	141	1,200	282	6,370	995	15	30	396
14	157	90	386	153	141	636	250	12,100	1,420	15	30	539
15	153	1,080	178	149	149	418	259	17,600	1,420	15	32	236
16	149	208	1,050	145	141	362	236	16,200	460	14	32	157
17	145	100	8,940	141	129	324	231	12,100	227	11	32	153
18	149	86	2,220	141	118	303	227	9,500	227	11	32	335
19	153	79	418	157	114	293	222	9,800	218	11	34	346
20	149	76	222	149	110	287	227	7,850	104	12	49	330
21	153	68	141	137	153	293	241	5,990	104	14	49	330
22	182	68	118	133	199	293	231	3,460	104	14	49	324
23	182	68	104	333	170	282	213	2,760	104	14	43	330
24	152	72	90	2,800	157	273	218	2,130	96	14	43	330
25	178	79	76	3,040	3,880	254	222	1,580	96	14	43	330
26	178	82	68	1,250	1,940	245	208	3,400	96	72	43	330
27	178	90	58	555	447	245	208	3,580	96	208	68	330
28	418	82	55	298	298	241	206	1,800	90	25	76	145
29	213	86	49	250	-------	254	218	2,630	90	9.4	62	383
30	145	90	49	218	-------	250	218	3,110	90	8.0	62	383
31	139	-------	46	204	-------	245	-------	6,190	-------	8.0	62	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	418	----------	118	7,260
November	1,080	62	131	7,800
December	6,940	46	552	33,900
January	3,040	129	416	25,600
February	3,880	110	366	20,300
March	1,200	118	307	18,900
April	2,860	208	373	22,200
May	17,600	141	4,300	264,000
June	4,990	90	1,040	61,900
July	208	8.0	50.9	3,130
August	149	6.0	42.8	2,630
September	539	58	217	12,900
The year	17,600	----------	664	481,000

Digitized by Google

EAST FORK OF TRINITY RIVER NEAR ROCKWALL, TEX.

LOCATION.—Chain gage on Dallas-Rockwall highway bridge 3 miles southwest of Rockwall, Rockwall County.

DRAINAGE AREA.—831 square miles.

RECORDS AVAILABLE.—November, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, 23,000 second-feet May 14 (gage height, 19.4 feet); no flow during several periods.

1923–1929: Maximum discharge, 23,000 second-feet July 14, 1926, and May 14, 1929; maximum gage height, 19.4 feet May 14, 1929; no flow during several periods.

The highest flood known, about 25 feet in spring of 1922.

REMARKS.—Records fair. No diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	34	13	104	300	1,260	190	83	4,000	36	4.9	0
2	0	104	13	97	270	596	166	71	2,600	36	3.5	0
3	0	150	12	90	280	435	150	62	1,070	36	2.3	0
4	0	66	12	202	300	391	142	56	521	52	1.5	0
5	0	26	10	1,060	290	340	150	50	360	116	1.1	0
6	0	14	9.8	2,070	260	402	142	53	469	250	.5	.4
7	0	7.6	8.6	2,070	270	270	134	53	1,030	132	.4	.6
8	0	5.9	7.2	1,240	250	250	283	50	1,170	48	.2	16
9	0	4.4	7.2	413	198	222	967	574	799	200	0	2.0
10	0	4.0	7.2	380	134	222	1,460	3,540	300	68	0	.2
11	0	3.4	8.2	340	182	230	3,490	8,950	240	40	0	0
12	0	3.0	9.2	240	222	581	2,920	5,140	206	32	0	0
13	0	2.2	160	198	300	1,870	635	2,450	174	24	0	0
14	0	1.9	424	190	340	2,900	360	10,500	158	21	0	0
15	0	133	320	152	350	2,300	340	12,400	142	19	0	9.6
16	0	455	484	166	340	1,040	280	5,400	126	17	0	11
17	0	272	7,060	158	300	657	240	3,080	111	16	0	3.7
18	0	97	10,400	166	260	402	222	3,060	104	14	0	1.9
19	0	46	10,800	190	222	380	198	5,050	97	12	0	.9
20	0	28	3,920	206	222	360	182	7,550	86	11	0	.5
21	0	19	1,120	174	270	424	166	3,410	80	9.5	0	.2
22	0	16	330	142	458	446	150	1,010	71	8.4	0	0
23	0	14	240	214	518	370	126	470	62	7.4	0	0
24	0	11	206	2,290	402	310	118	370	56	6.6	0	0
25	0	9.5	182	4,660	741	260	118	320	50	6.5	0	0
26	0	9.2	166	5,400	3,170	222	111	350	48	9.0	0	0
27	0	9.2	150	3,240	6,270	214	111	402	62	6.3	0	0
28	0	9.2	142	958	4,220	206	97	447	48	6.3	0	0
29	0	12	126	482	------	222	97	2,390	43	12	0	0
30	8.0	13	118	446	------	230	97	4,440	38	7.8	0	0
31	13	------	111	370	------	214	------	5,980	------	6.3	0	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	13	0	.68	42
November	458	1.9	52.8	3,140
December	10,800	7.2	1,180	72,600
January	5,400	90	908	55,800
February	6,270	134	763	42,400
March	2,900	206	589	36,200
April	3,490	97	461	27,400
May	12,400	50	2,830	174,000
June	4,000	38	477	28,400
July	250	6.3	40.9	2,510
August	4.9	0	.47	29
September	16	0	1.57	93
The year	12,400	0	612	443,000

Digitized by Google

SAN JACINTO RIVER BASIN

SAN JACINTO RIVER NEAR HUMBLE, TEX.

LOCATION.—Chain gage at bridge crossing on State highway No. 35, 900 feet below Houston East & West Texas Railway bridge 2½ miles north of Humble, Harris County.

DRAINAGE AREA.—1,810 square miles.

RECORDS AVAILABLE.—October, 1928, to September, 1929.

EXTREMES.—Maximum discharge during period, about 111,000 second-feet May 31 (gage height, 32.25 feet); minimum, 39 second-feet Oct. 26 (gage height, 1.34 feet).

A stage of about 35 feet was reached in 1920.

REMARKS.—Records fair. No diversions above station

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		41	54	74	294	264	426	320	85,500	284	178	72
2		47	66	77		234	403	451	39,100	266	164	69
3		52	68	77	315	195	403	380	18,600	284	218	63
4		80	68	81	605	195	359	380	9,920	266	168	63
5		74	63	970	690	455	320	302	6,880	563	145	60
6		64	63	1,840	780	690	284	249	7,780	1,570	136	60
7		62	58	4,280	1,130	505	249	204	6,600	2,850	124	60
8		60	56	4,680	930	298	249	191	3,290	4,190	105	60
9		62	56	3,510	780	247	670	178	2,000	6,320	108	60
10		62	58	2,640	720	195	670	178	1,240	5,200	105	60
11		55	96	1,750	530	182	1,100	159	798	3,180	105	57
12		53	109	1,130	410	208	2,000	145	584	1,380	99	78
13		50	170	810	332	491	6,370	191	528	640	94	150
14		50	410	720	280	2,060	14,600	191	403	451	91	120
15		55	505	630	264	3,790	22,000	1,530	640	426	91	94
16		48	332	870	234	4,190	21,500	2,850	830	403	88	98
17		46	247	870	220	3,510	14,200	4,310	528	359	81	232
18		46	220	1,060	220	2,630	8,720	6,460	451	284	78	150
19		46	315	1,060	208	1,280	5,480	17,100	451	266	78	112
20		50	390	930	208	690	3,290	20,200	359	232	78	94
21		53	195	870	195	630	1,800	13,800	320	218	78	84
22		53	182	690	195	1,770	1,330	13,200	266	204	78	66
23	41	53	170	505	195	4,070	900	7,480	266	191	78	63
24	41	53	170	410	195	5,200	640	4,550	284	178	75	55
25	40	53	126	370	195	6,040	528	2,520	476	168	75	55
26	39	57	119	332	195	5,070	380	1,800	451	164	75	55
27	40	53	102		234	3,070	359	2,100	403	159	75	52
28	41	53	77		247	1,360	320	4,360	302	159	75	49
29	41	53	53	294	------	798	302	10,300	284	164	75	52
30	41	60	53		------	584	284	34,700	302	204	72	52
31	41	------	53		------	476	------	94,900	------	178	72	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October 23–31	41	39	40.5	720
November	80	41	54.8	3,260
December	505	53	152	9,350
January	4,680	74	1,060	65,200
February	1,130	195	396	22,000
March	6,040	182	1,660	102,000
April	22,000	249	3,670	218,000
May	94,900	145	7,930	488,000
June	85,500	266	6,330	377,000
July	6,320	159	1,010	62,100
August	218	72	102	6,270
September	232	49	79.8	4,750
The period				1,360,000

Digitized by Google

BRAZOS RIVER BASIN

DOUBLE MOUNTAIN FORK OF BRAZOS RIVER NEAR ASPERMONT, TEX.

LOCATION.—Chain gage on Aspermont-Hamlin highway bridge in southeast corner of sec. 134, 11 miles south of Aspermont, Stonewall County.

DRAINAGE AREA.—7,980 square miles, a large part of which is probably non-contributing.

RECORDS AVAILABLE.—December, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, about 14,700 second-feet May 17 (gage height, 9.80 feet); no flow during several periods.

1923–1929: Maximum discharge, determined by slope-area method, about 45,800 second-feet Oct. 15, 1926 (gage height, 18.14 feet, from floodmarks); no flow during several periods.

REMARKS.—Monthly records poor. Records of daily discharge not sufficiently accurate for publication. No diversions above station.

Monthly discharge, in second-feet, 1928–29

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	107	0	3.78	232
November	102	.7	9.16	545
December	3.0	----------	1.20	74
January	1.4	----------	.41	25
February	26	0	1.27	71
March	150	0	10.8	664
April	100	0	18.0	1,070
May	3,090	0	385	23,700
June	3,260	0	321	19,100
July	2,180	0	205	12,600
August	----------	----------	[a] .10	6.1
September	6,300	.1	921	54,800
The year	6,300	0	156	113,000

[a] Estimated.

Digitized by Google

BRAZOS RIVER AT SEYMOUR, TEX.

LOCATION.—Chain gage on Wichita Valley highway bridge three-fourths of a mile above Wichita Valley Railway bridge and 1 mile southwest of courthouse in Seymour, Baylor County.

DRAINAGE AREA.—14,500 square miles, a large part of which is probably noncontributing.

RECORDS AVAILABLE.—November, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, 29,000 second-feet Sept. 9 (gage height, 11.00 feet); no flow during several periods.

1923–1929: Maximum discharge, 52,100 second-feet Oct. 16, 1926 (gage height, 15.16 feet, from floodmarks); no flow during several periods.

From local information a stage of about 20.0 feet occurred in 1916.

REMARKS.—Records poor. No diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Nov.	Dec.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	9.0	0	1.4	140	12	101	0	7.8	0
2	19	5.1	0	9.6	88	7.2	70	16	4.8	0
3	26	2.6	0	15	62	2.0	112	4,030	2.4	0
4	14	1.4	0	26	29	0	151	1,450	.5	0
5	7.8	1.8	0	13	46	0	129	350	0	3,110
6	4.2	3.6	0	9.6	27	0	5,560	244	0	2,930
7	3.0	3.0	0	13	24	0	5,160	98	0	692
8	7.2	1.4	0	9.9	22	0	2,430	33	0	3,370
9	9.6	.4	0	6.6	12	0	1,000	26	0	24,000
10	6.6	.8	17	14	4.2	0	1,720	24	0	9,030
11	3.6	1.4	26	25	2.0	0	830	31	0	6,120
12	1.4	1.2	23	47	0	22	162	34	0	3,450
13	3.0	1.8	17	147	0	655	125	28	0	1,840
14	8.4	3.3	12	83	0	1,220	88	17	0	1,460
15	8.4	2.8	9.6	81	0	463	34	10	0	1,250
16	5.4	.7	6.9	57	0	2,250	22	7.8	0	920
17	52	1.8	4.2	37	0	3,320	18	3.0	0	546
18	41	4.2	4.2	22	0	2,560	2.0	0	0	320
19	29	6.6	9.0	14	0	1,500	6.9	3,010	0	499
20	22	7.2	8.4	9.6	0	890	.3	2,680	0	570
21	17	3.6	6.6	13	0	534	0	630	0	284
22	12	2.2	4.2	11	0	260	0	228	0	174
23	8.4	.9	2.6	9.0	0	109	0	845	0	132
24	4.8	.2	1.4	11	0	67	0	488	0	90
25	4.2	.4	4.2	16	197	67	52	125	0	67
26	1.4	.1	6.6	26	168	268	27	129	0	52
27	4.2	.5	4.5	37	106	582	15	47	0	32
28	7.8	0	2.8	103	57	466	14	42	0	29
29	14	0	------	168	35	268	13	25	0	28
30	13	0	------	90	21	147	12	20	0	39
31	------	0	------	54	------	120	------	14	0	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
November	52	0	11.9	708
December	9.0	0	2.19	135
February	26	0	6.08	338
March	168	1.4	38.0	2,340
April	197	0	34.7	2,060
May	3,320	0	509	31,300
June	5,560	0	595	35,400
July	4,030	0	474	29,100
August	7.8	0	.50	31
September	24,000	0	2,030	121,000
The year	24,000	0	307	222,000

NOTE.—No flow during October and January.

Digitized by Google

BRAZOS RIVER NEAR MINERAL WELLS, TEX.

LOCATION.—Chain gage on Mineral Wells-Palo Pinto highway bridge 4 miles west of Mineral Wells, Palo Pinto County.

DRAINAGE AREA.—23,100 square miles, a large part of which is probably noncontributing.

RECORDS AVAILABLE.—January, 1924, to September, 1929.

EXTREMES.—Maximum discharge during year, about 66,200 second-feet Sept. 10 (gage height, 17.00 feet, determined from graph drawn from daily gage readings); no flow Aug. 17 to Sept. 7.

1924–1929: Maximum discharge not determined (gage height, 17.35 feet Oct 18, 1926); no flow for several periods.

REMARKS.—Records poor. No diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	455	41	13	16	34	47	319	2,520	18	160	0
2	12	398	35	12	18	34	55	191	2,920	677	126	0
3	12	1,280	30	12	18	31	160	147	1,520	1,280	103	0
4	12	902	25	57	20	27	119	133	902	1,840	81	0
5	12	585	22	2,860	17	24	84	112	626	1,780	71	0
6	12	426	21	626	18	22	68	89	477	1,980	53	0
7	12	319	19	412	18	20	61	66	391	1,340	28	0
8	10	262	19	289	17	18	106	51	7,360	804	15	2,150
9	10	210	21	398	18	17	126	43	3,840	626	10	1,650
10	9.5	173	24	272	16	16	109	40	2,720	850	6.0	29,100
11	9.5	147	24	137	16	14	78	35	1,780	530		50,200
12	9.2	119	28	103	14	40	68	244	1,520	1,010		31,500
13	9.0	100	33	89	14	84	128	8,600	1,840	1,720		13,700
14	8.2	89	34	74	13	129	155	9,780	1,120	902	1.0	9,780
15	8.0	95	31	55	13	112	112	4,080	758	492		7,600
16	7.8	78	40	45	16	191	95	4,320	569	338		4,080
17	7.5	71	126	37	16	272	78	4,700	440	256	0	2,720
18	7.0	76	147	33	15	306	59	11,300	350	177	0	2,260
19	6.8	173	112	30	14	419	74	23,000	245	129	0	1,460
20	6.2	106	84	27	14	294	86	10,900	182	112	0	1,060
21	6.0	95	59	24	16	278	66	8,640	137	84	0	850
22	8.0	81	59	22	19	225	258	4,610	103	752	0	1,060
23	7.8	57	137	22	18	186	507	2,920	76	1,520	0	955
24	7.0	51	112	28	17	155	303	2,520	61	955	0	1,120
25	5.5	43	84	25	26	137	294	1,650	51	577	0	712
26	4.1	41	59	21	22	92	344	1,340	37	1,180	0	515
27	3.5	68	43	24	21	74	1,520	955	30	804	0	391
28	2.8	71	26	22	35	81	1,340	804	27	554	0	319
29	4.7	55	21	21	------	86	850	1,010	23	440	0	256
30	46	47	18	19	------	68	500	6,110	21	319	0	220
31	106	------	16	18	------	57	------	4,080	------	240	0	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	106	2.8	12.7	781
November	1,280	41	222	13,200
December	147	16	50.0	3,070
January	2,860	12	188	11,600
February	35	13	17.7	983
March	419	14	114	7,010
April	1,520	47	264	15,700
May	23,000	35	3,640	224,000
June	7,360	21	1,090	64,900
July	1,980	18	783	48,100
August	160	0	21.3	1,310
September	50,200	0	5,460	325,000
The year	50,200	0	987	716,000

Digitized by Google

BRAZOS RIVER NEAR GLEN ROSE, TEX.

LOCATION.—Staff gage a quarter of a mile above Glen Rose-Cleburne highway bridge and 4 miles northeast of Glen Rose, Somervell County.

DRAINAGE AREA.—24,800 square miles, a large part of which is probably non-contributing.

RECORDS AVAILABLE.—October, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, 38,400 second-feet Sept. 12 (gage height, 13.42 feet); minimum, 0.8 second-foot Sept. 3–7.

1923–1929: Maximum discharge, about 45,700 second-feet May 8, 1925 (gage height, 15.10 feet); no flow Sept. 7–9, 1924.

REMARKS.—Records fair. No diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	48	113	103	108	98	506	145	1,560	5,630	98	427	0.9
2	48	78	93	93	113	326	123	1,000	4,070	88	350	.8
3	88	123	83	78	113	262	123	655	4,070	78	290	.8
4	98	162	78	88	108	216	113	456	4,070	118	235	.8
5	66	235	75	824	103	190	103	350	2,880	98	190	.8
6	46	385	75	6,450	103	156	83	276	1,960	1,070	150	.8
7	41	928	69	1,960	98	134	134	222	1,500	1,960	123	.8
8	37	688	66	1,500	93	123	203	197	1,120	1,690	108	1,360
9	30	456	63	1,120	93	113	2,650	210	3,730	1,690	78	940
10	27	390	72	744	113	108	1,980	184	5,630	1,300	66	1,740
11	25	350	98	526	93	108	1,000	156	4,540	860	54	32,100
12	22	304	113	382	103	250	622	162	3,850	600	44	37,200
13	20	262	128	342	103	798	382	156	2,550	688	41	23,300
14	21	276	150	311	88	871	304	4,710	1,820	655	34	12,500
15	24	255	173	255	83	1,030	446	9,840	2,240	991	29	9,840
16	18	229	475	216	75	849	382	5,330	1,960	1,820	25	8,030
17	16	197	2,280	178	75	374	248	3,640	1,300	1,040	22	6,830
18	15	167	4,300	162	63	297	235	4,070	906	558	17	5,330
19	14	150	5,630	145	63	276	2,840	8,480	699	390	15	4,790
20	12	139	3,590	123	72	248	2,600	21,900	722	304	14	4,070
21	8.5	128	1,180	103	103	390	1,000	11,300	476	262	11	3,440
22	4.4	118	382	103	113	374	688	8,030	366	197	11	1,960
23	2.9	134	304	108	108	466	342	5,050	304	235	10	1,690
24	1.9	156	235	145	103	398	611	3,640	262	167	8.0	1,620
25	1.5	167	203	684	2,840	326	951	3,250	222	139	5.0	
26	1.1	156	173	506	1,470	283	408	3,850	197	853	4.4	
27	.8	145	173	446	894	255	456	2,550	173	1,120	3.8	1,380
28	10	134	162	290	814	216	655	1,820	150	666	2.6	
29	30	123	162	203	-------	203	548	1,560	128	1,060	2.0	
30	48	113	145	145	-------	190	1,980	4,760	118	894	1.4	
31	78	-------	123	113	-------	167	-------	9,230	-------	558	1.0	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	98	0.8	29.1	1,790
November	928	78	242	14,400
December	5,630	63	676	41,600
January	6,450	78	595	36,600
February	2,840	63	296	16,400
March	1,030	108	339	20,800
April	2,840	83	745	44,300
May	21,900	156	3,830	236,000
June	5,630	118	1,920	114,000
July	1,960	78	718	44,100
August	427	1.0	76.5	4,700
September	37,200	.8	5,500	327,000
The year	37,200	.8	1,250	902,000

Digitized by Google

BRAZOS RIVER AT WACO, TEX.

LOCATION.—Water-stage recorder at Texas Electric Co.'s bridge in Waco, McLennan County. Zero of gage, 356.99 feet above mean sea level.

DRAINAGE AREA.—28,500 square miles, a large part of which is probably non-contributing.

RECORDS AVAILABLE.—September, 1898, to December, 1911, and October, 1914, to September, 1929.

EXTREMES.—Maximum discharge during year, 47,400 second-feet Sept. 13 (gage height, 20.66 feet); minimum, 3.7 second-feet Sept. 5.

1898–1929: Maximum discharge not determined (gage height, 29.7 feet Dec. 3, 1913); no flow Aug. 20 and 21, 1918, and probably for several days in August, 1923.

REMARKS.—Records poor. The numerous small diversions above station do not appreciably affect flow except during low stages.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		66		253	303	1,240	394	1,180	11,900	201	1,100	9.8
2		89		239	323	1,100	376	1,580	7,270	187	715	8.2
3		115		222	295	895	358	1,800	5,680	187	536	7.0
4		84		264	270	663	348	1,420	4,900	187	440	6.4
5		84		2,380	260	530	340	1,100	5,260	303	358	6.1
6		71		1,220	250	460	335	865	4,270	184	295	122
7		78	35	2,740	239	402	335	702	3,700	184	264	309
8		86		2,200	228	353	340	585	2,800	359		8,080
9		458		1,740	207	315	953	585	2,320	1,470		15,400
10		536		1,580	184	299	3,010	519	2,950	1,860		3,420
11	98	440		1,250	201	299	3,150	852	5,680	1,960		3,150
12		348		962	198	778	1,910	592	4,900	1,380		36,100
13		292	253	722	184	2,260	2,360	932	4,180	970		45,700
14		253	307	574	190	2,720	4,870	955	3,550	715		21,500
15		274	165	508	207	1,690	2,080	4,410	2,880	656		11,800
16		228	195	465	210	1,370	1,740	6,960	2,320	696	80	9,320
17		246	4,160	402	204	1,120	1,690	5,260	2,800	630		7,770
18		239	4,740	362	187	1,000	1,690	8,330	2,320	1,470		6,100
19		213	3,780	323	176	775	1,640	8,160		1,160		4,810
20			2,740	288	179	1,070	16,000	16,300		696		3,850
21			1,580	264	207	850	4,200	21,100		497		3,700
22	23		1,120	250	239	745	2,580	8,390		389		3,190
23	22		790	246	246	730	2,020	7,520		315		2,260
24	19		604	250	292	715	1,690	6,100	810	270	15	1,910
25	18	73	508	213	288	722	6,080	5,470		344	17	1,740
26	17		416	480	2,460	682	2,880	8,540		323	12	1,280
27	18		362	552	2,540	604	1,960	7,610		232	10	1,180
28	19		323	656	1,690	541	1,260	7,940		358	11	1,180
29	203		284	611	-------	502	985	7,960		1,140	10	1,180
30	104		253	486	-------	465	2,030	16,900		828	8.2	1,100
31	91	-------	253	366	-------	430	-------	21,400	-------	828	8.6	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	-------	-------	83.6	5,140
November	536	-------	167	9,940
December	4,740	-------	750	46,100
January	2,740	213	744	45,700
February	2,540	176	445	24,700
March	2,720	299	849	52,200
April	16,000	335	2,320	138,000
May	21,400	519	5,870	361,000
June	11,900	-------	2,980	177,000
July	1,960	184	677	41,600
August	1,100	8.2	164	10,100
September	45,700	6.1	6,540	389,000
The year	45,700	6.1	1,800	1,300,000

Digitized by Google

BRAZOS RIVER NEAR BRYAN, TEX.

LOCATION.—Chain gage on Pitts Bridge on State highway between Bryan and Caldwell, 9 miles southwest of Bryan, Brazos County.

DRAINAGE AREA.—38,400 square miles, part of which is probably noncontributing.

RECORDS AVAILABLE.—September, 1925, to September, 1929. February, 1918, to September, 1925, record obtained 7½ miles downstream; discharge practically the same.

EXTREMES.—Maximum discharge during year not determined (gage height, 44.4 feet May 30); minimum, 113 second-feet Oct. 20 (gage height, 3.22 feet).

1925–1929: Maximum discharge not determined; minimum, that of Oct. 20, 1928.

Maximum stage of about 55.00 feet (present gage datum) occurred December, 1913.

REMARKS.—Records fair. The numerous small diversions above gage do not appreciably affect flow, except during low stages.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	412	192	412	670	928	1,460	928	5,350	100,000	1,540	928	165
2	406	263	300	530	1,200	1,730	778	5,650		1,460	928	165
3	394	180	272	346	1,820	1,540	705	4,380	36,700	1,640	928	169
4	400	325	295	436	2,440	1,460	705	3,260	19,500	1,820	965	169
5	400	300	258	1,460	1,920	1,280	705	3,020	13,300	2,440	1,040	167
6	228	300	238	4,000	1,460	1,120	705	2,540	9,940	2,780	890	157
7	194	300	238	5,500	565	965	635	2,220	8,440	2,220	778	15
8	167	290	222	4,000	890	928	740	2,120	7,429	1,730	670	212
9	123	276	190	3,880	815	852	3,770	1,730	6,340	1,370	635	4,950
10	119	254	215	3,020	670	778	15,600	1,460	5,350	1,120	495	17,000
11	123	242	315	2,780	495	705	13,200	1,370	5,200	1,370	460	10,800
12	190	320	370	2,780	412	928	7,600	1,640	6,340	2,120	442	7,210
13	183	600	600	2,220	382	2,660	7,350	2,330	6,160	2,330	412	24,000
14	172	815	495	2,220	382	6,340	12,600	2,900	5,500	2,120	376	31,100
15	176	740	448	2,020	382	6,700	13,100	5,350	5,050	1,730	352	21,800
16	194	670	1,730	1,640	382	3,750	10,700	6,520	4,640	1,460	330	13,800
17	212	600	3,880	1,370	382	3,260	6,340	10,400	4,510	1,200	300	9,940
18	235	565	7,190	1,200	382	2,660	4,000	10,400	4,250	1,200	290	7,240
19	167	454	16,200	1,040	382	2,540	3,620	15,300	4,000	1,200	272	6,340
20	113	394	8,530	890	382	2,020	6,000	14,500	3,620	1,200	245	5,200
21	119	394	2,400	778	382	2,540	17,300	17,900	3,260	1,280	238	4,640
22	142	418	1,040	740	382	3,020	9,280	18,100	3,020	1,460	225	4,120
23	194	364	1,370	705	382	2,540	4,510	9,070	2,660	1,540	225	3,750
24	190	330	1,730	600	382	2,540	3,260	8,230	2,330	1,040	212	3,140
25	161	281	1,540	565	430	2,120	3,140	8,650	2,220	815	202	2,780
26	138	238	1,370	495	394	1,640	3,500	13,300	2,120	852	200	2,330
27	147	238	1,370	635	382	1,370	3,620	23,400	1,920	890	200	1,920
28	155	414	1,200	1,040	2,520	1,280	3,260	39,100	1,820	890	200	1,820
29	172	1,540	1,120	965	------	1,280	3,260		1,730	852	197	1,730
30	174	1,370	890	815	------	1,120	3,620	100,000	1,540	852	190	1,730
31	178	------	670	815	------	1,040	---- ---	------	------	852	178	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	412	113	206	12,700
November	1,540	180	456	27,100
December	16,200	190	1,840	113,000
January	5,500	346	1,620	99,600
February	2,520	382	783	43,500
March	6,700	705	2,070	127,000
April	17,300	635	5,480	326,000
May	----------	1,370	17,400	1,070,000
June	----------	1,540	12,600	750,000
July	2,780	815	1,460	89,800
August	1,040	178	452	27,800
September	31,100	155	6,290	374,000
The year	----------	113	4,230	3,060,000

Digitized by Google

BRAZOS RIVER AT ROSENBERG, TEX.

LOCATION.—Chain gage on Rosenberg-Richmond highway bridge at Rosenberg, Fort Bend County.

DRAINAGE AREA.—44,000 square miles.

RECORDS AVAILABLE.—October, 1922, to September, 1929.

EXTREMES.—Maximum discharge during year, 123,000 second-feet June 6 (gage height, 46.2 feet); minimum, 250 second-feet Sept. 2 (gage height, 0.2 foot).

1922–1929: Maximum discharge, that of June 6, 1929; minimum, that of Sept. 2, 1929.

The flood of Dec. 9, 1913, reached a stage of 55.5 feet (from floodmarks).

REMARKS.—Records poor. No diversions. Gage-height record furnished by United States Weather Bureau.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	760	520	592	4,240	1,480	2,560	2,520	9,450	83,900	3,090	1,730	303
2	808	556	632	3,280	1,540	3,840	2,220	7,350	90,000	3,180	1,480	250
3	760	556	716	3,380	1,600	4,100	2,220	5,780	95,400	3,380	916	808
4	632	592	808	4,900	1,670	4,240	1,930	7,650	117,000	5,130	1,310	556
5	760	592	972	11,800	1,800	3,970	1,600	6,900	117,000	7,360	1,480	520
6	672	592	1,200	13,100	1,800	3,000	1,540	6,340	123,000	11,700	1,420	556
7	592	632	1,030	8,850	1,930	3,000	1,360	5,500	118,000	14,800	1,540	556
8	592	632	972	8,250	2,220	2,840	1,540	5,220	101,000	16,600	1,540	486
9	556	672	860	8,100	2,370	2,760	4,420	4,380	69,800	16,000	1,480	520
10	556	672	2,040	7,500	2,600	2,600	11,800	3,600	44,100	10,400	1,250	556
11	556	760	3,600	7,200	2,600	2,220	13,500	2,300	31,400	9,600	916	716
12	556	760	4,100	6,340	2,370	2,080	15,300	2,680	24,100	9,450	916	12,100
13	592	760	4,380	5,780	2,300	1,670	17,800	3,090	20,800	7,350	916	10,700
14	592	760	4,380	5,920	2,220	1,540	37,700	3,970	18,200	5,360	916	11,000
15	592	760	5,780	7,350	2,000	1,640	43,100	4,800	18,000	5,080	860	25,400
16	592	760	5,360	6,900	1,800	4,140	30,900	6,900	15,200	4,240	808	24,000
17	672	760	4,380	6,060	1,730	8,550	25,100	15,200	16,100	3,840	716	14,800
18	672	760	3,600	6,060	1,670	8,250		26,400	14,000	2,920	716	13,700
19	632	760	4,940	5,500	1,600	6,620		27,300	11,100	2,680	716	12,100
20	632	716	7,950	5,360	1,540	4,240		28,300	9,600	2,150	808	9,750
21	592	716	8,700	4,240	1,360	7,410	13,300	25,900	8,250	2,000	860	9,600
22	672	760	7,050	3,970	1,310	12,400		25,200	7,950	1,540	860	7,200
23	760	760	5,920	3,000	1,250	12,600		25,400	6,060	1,540	860	7,200
24	672	760	4,660	3,000	1,200	11,400		24,500	5,080	1,480	672	8,550
25	632	760	4,380	2,840	1,080	6,210		19,200	4,660	1,860	556	7,050
26	632	716	4,100	2,680	1,140	5,640	7,350	18,200	4,100	1,730	556	5,780
27	486	672	4,520	2,520	1,140	5,080	6,900	20,600	3,970	1,730	592	5,220
28	520	632	4,800	2,220	1,250	4,520	7,200	28,700	3,970	1,730	452	2,370
29	331	632	4,660	2,080	.....	3,720	7,350	45,000	3,970	1,670	420	3,000
30	420	592	4,660	1,670	.....	3,380	6,760	72,600	4,100	1,480	360	2,520
31	486	.....	4,520	1,540	.....	2,840	.....	82,900	.....	1,360	360	.....

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	808	331	612	37,600
November	760	520	686	40,800
December	8,700	592	3,750	231,000
January	13,100	1,540	5,340	328,000
February	2,600	1,080	1,730	96,100
March	12,600	1,540	4,810	296,000
April	43,100	1,360	11,900	708,000
May	82,900	2,300	18,400	1,130,000
June	123,000	3,970	39,700	2,360,000
July	16,600	1,360	5,240	322,000
August	1,730	360	935	57,500
September	25,400	250	6,600	393,000
The year	123,000	250	8,290	6,000,000

Digitized by Google

CLEAR FORK OF BRAZOS RIVER AT NUGENT, TEX.

LOCATION.—Staff gage at highway bridge at Nugent, Jones County.
DRAINAGE AREA.—2,220 square miles.
RECORDS AVAILABLE.—February, 1924, to September, 1929.
EXTREMES.—Maximum discharge during year, 5,420 second-feet Sept. 11 (gage height, 11.38 feet, determined from graph drawn from daily gage readings); no flow Aug. 31 to Sept. 5.
1924–1929: Maximum discharge, 11,500 second-feet May 20, 1928 (gage height, 18.0 feet); no flow during several periods.
REMARKS.—Records fair. No diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.5	49	8.5	8.0	7.0	7.0	9.5	6.5	40	6.5	3.3	0
2	9.5	32	8.5	8.0	7.0	7.0	8.0	3.6	28	5.7	3.6	0
3	9.5	64	8.5	8.0	8.0	7.0	6.5	2.7	23	5.7	2.7	0
4	9.5	27	8.5	8.0	9.0	7.0	6.5	2.7	108	22	2.0	0
5	9.5	14	8.5	8.0	9.0	7.0	7.0	2.7	35	15	1.5	0
6	9.5	10	8.5	8.0	9.0	7.0	6.0	2.6	26	9.5	.7	52
7	9.5	9.5	8.5	7.5	9.0	7.0	5.1	2.2	20	676	1.3	518
8	9.0	8.5	8.5	7.0	9.0	7.0	5.1	2.6	18	1,920	2.0	697
9	8.0	8.5	8.5	8.0	9.0	7.0	5.1	165	15	1,580	1.5	1,620
10	7.5	8.5	8.5	8.0	9.0	7.0	5.1	860	15	357	.8	1,920
11	7.5	8.5	9.5	8.0	8.5	7.0	5.1	1,090	13	44	.4	4,280
12	7.5	7.5	9.5	8.0	7.0	498	5.1	386	13	18	.4	3,500
13	7.5	9.5	9.0	8.0	7.0	621	5.1	38	11	12	.3	1,600
14	7.5	80	9.0	8.0	7.0	133	8.5	149	11	10	.2	1,680
15	7.5	52	9.0	7.5	7.0	111	7.5	402	11	9.5	24	231
16	7.5	15	9.0	7.0	7.0	72	7.0	440	10	9.0	30	91
17	7.5	10	9.0	7.0	7.0	23	5.4	459	9.5	9.0	5.7	655
18	6.5	8.5	9.0	7.0	7.0	12	5.1	1,030	9.5	9.0	4.2	831
19	6.5	8.5	9.0	7.0	7.0	9.0	381	666	9.0	7.0	2.9	690
20	6.5	8.5	9.0	7.0	8.0	7.5	50	1,410	8.5	9.5	2.3	540
21	6.5	8.5	9.0	7.0	8.0	7.5	9.5	496	8.5	28	2.0	87
22	6.5	7.5	9.0	7.0	8.0	8.0	6.5	68	8.0	18	1.6	62
23	6.5	7.5	9.0	7.0	8.0	7.5	4.8	40	8.0	5.7	1.0	47
24	6.5	7.5	9.0	7.0	8.0	7.5	4.5	56	8.0	5.4	.6	37
25	6.5	7.5	8.0	7.0	8.0	7.0	3.3	510	7.0	5.4	.4	37
26	6.5	8.5	8.0	7.0	8.0	6.5	2.9	2,130	6.0	4.8	.3	34
27	6.5	9.5	8.0	7.0	9.0	6.0	2.7	1,920	5.7	102	.2	32
28	6.5	10	8.0	7.0	8.0	10	12	498	6.5	22	.1	31
29	6.5	9.5	8.0	7.0	-------	19	8.5	108	6.5	10	.1	28
30	6.5	9.5	7.0	7.0	-------	31	7.0	60	6.5	6.5	.1	25
31	53	-------	7.0	7.0	-------	12	-------	72	-------	4.2	0	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	53	6.5	9.06	557
November	80	7.5	17.5	1,040
December	9.5	7.0	8.58	528
January	8.0	7.0	7.42	456
February	9.0	7.0	7.95	442
March	621	6.0	54.4	3,340
April	381	2.7	20.2	1,200
May	2,130	2.2	422	25,900
June	108	5.7	16.8	1,000
July	1,920	4.2	160	9,840
August	30	0	3.10	191
September	4,280	0	644	38,300
The year	4,280	0	114	82,800

Digitized by Google

CLEAR FORK OF BRAZOS RIVER AT FORT GRIFFIN, TEX.

LOCATION.—Chain gage on Fort Griffin-Throckmorton highway bridge half a mile east of Fort Griffin, Shackleford County.
DRAINAGE AREA.—3,970 square miles.
RECORDS AVAILABLE.—December, 1923, to September, 1929.
EXTREMES.—Maximum discharge during year, 5,710 second-feet Sept. 13 (gage height, 16.43 feet); no flow during several periods.
1923–1929: Maximum discharge, about 12,500 second-feet June 21, 1926 (gage height, 27.0 feet); no flow for several periods.
REMARKS.—Records fair. Small diversions for municipal use; amount not known. Possibly some regulation at low stages by power plant at Stamford.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.2	197	8.1	9.8	4.6	16	19	9.0	213	1.7	11	0
2	2.8	200	8.1	9.8	4.6	16	19	6.6	177	1.9	7.2	0
3	2.8	103	8.7	11	5.0	18	17	6.0	164	3.4	5.6	0
4	2.4	69	8.7	12	5.0	19	15	5.6	307	47	*3.6	0
5	1.5	50	9.4	12	5.4	19	13	4.4	187	58	1.5	0
6	*1.6	56	11	11	5.4	16	14	3.2	90	28	1.3	432
7	*1.7	62	11	13	6.3	14	14	2.8	81	14	.5	567
8	*1.8	43	9.8	14	7.5	14	16	3.2	88	81	.2	257
9	1.9	32	9.8	16	12	16	22	3.2	111	1,840	*.1	1,030
10	*2.2	29	11	17	13	15	19	5.6	107	1,940	0	3,150
11	*2.5	28	11	15	13	14	16	5.8	64	522	0	5,010
12	2.8	26	11	14	13	16	16	999	49	170	0	5,370
13	2.4	26	12	14	11	17	14	2,310	13	77	0	4,760
14	2.4	23	12	11	11	394	14	2,240	9.0	64	0	2,140
15	2.8	18	11	10	10	329	11	1,270	9.4	55	0	1,940
16	2.8	17	10	10	10	124	11	2,410	8.1	46	0	667
17	1.6	14	10	10	9.4	64	10	2,940	*7.0	28	0	105
18	1.2	13	9.4	8.7	7.5	38	11	3,960	5.8	23	0	200
19	1.2	13	9.4	7.5	10	24	147	3,540	*5.5	20	0	449
20	.3	13	8.1	8.1	16	17	732	1,700	5.2	16	0	510
21	.3	13	8.7	8.1	22	18	377	1,450	5.0	86	0	787
22	0	11	8.1	8.1	20	19	182	926	5.0	16	0	187
23	0	9.0	9.4	8.7	20	18	51	200	5.2	21	0	77
24	0	9.8	8.1	8.1	18	22	575	95	4.8	36	0	66
25	0	9.0	7.5	7.5	18	22	1,420	70	3.8	22	0	56
26	0	9.8	7.2	6.9	16	22	359	69	2.6	9.8	0	33
27	0	9.8	7.8	5.8	16	24	67	2,690	2.6	14	0	28
28	0	9.8	7.2	5.8	16	51	28	3,460	3.0	13	0	22
29	0	9.0	6.6	5.8	-------	44	16	1,470	1.9	*16	0	25
30	5.0	7.8	7.2	5.4	-------	24	12	323	1.9	18	0	25
31	11	-------	7.8	5.0	-------	23	-------	200	-------	11	0	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	11	0	1.91	117
November	200	7.8	37.7	2,240
December	12	6.6	9.20	566
January	17	5	9.97	613
February	22	4.6	11.6	644
March	394	14	48.0	2,950
April	1,420	10	141	8,390
May	3,960	2.8	1,040	64,000
June	307	1.9	57.9	3,450
July	1,940	1.7	171	10,500
August	11	0	1.00	61
September	5,370	0	930	55,300
The year	5,370	0	206	149,000

* Estimated.

Digitized by Google

CLEAR FORK OF BRAZOS RIVER AT CRYSTAL FALLS, TEX.

LOCATION.—Staff gage at Walker-Caldwell Water Co.'s pumping plant a quarter of a mile north of Crystal Falls, Stephens County.

DRAINAGE AREA.—4,320 square miles.

RECORDS AVAILABLE.—November, 1921, to February, 1929, when station was discontinued.

EXTREMES.—Maximum discharge during period of current year, 730 second-feet Nov. 1 (gage height, 1.95 feet, determined from gage-height graph drawn from daily gage readings); no flow during several periods.

1921–1929: Maximum discharge not determined (gage height, 18.25 feet Apr. 30, 1922); no flow during several periods.

REMARKS.—Records for low stages good, for high stages poor. Large part of ordinary flow diverted for municipal use and mining. Low-water flow partly regulated by dam above gage.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Day	Oct.	Nov.	Dec.	Jan.	Feb.
1	1.2	598	14	8.0	0	16	0	19	22	6.0	4.4
2	.4	278	16	8.0	.8	17	0	32	16	5.2	3.6
3	0	139	16	5.2	1.2	18	0	10	12	5.2	2.8
4	0	82	14	5.2	1.2	19	0	5.2	12	5.2	2.0
5	0	40	12	3.6	.8	20	0	5.2	12	4.4	2.0
6	0	62	12	3.6	1.2	21	0	18	12	2.8	5.2
7	0	40	14	2.0	1.2	22	0	16	16	2.8	5.2
8	0	32	14	5.2	.8	23	0	10	12	2.0	5.2
9	0	32	14	8.0	.4	24	0	8.0	10	2.0	5.2
10	0	22	12	5.2	0	25	0	8.0	10	2.0	5.2
11	0	16	16	5.2	0	26	0	8.0	10	2.0	5.2
12	0	14	16	8.0	0	27	0	12	10	1.6	5.2
13	0	14	29	5.2	0	28	0	12	10	1.2	5.2
14	0	198	22	8.0	0	29	3.6	12	10	.8	------
15	0	65	22	6.0	8.0	30	3.6	12	8.0	.4	------
						31	150	------	8.0	.4	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	150	0	5.12	315
November	598	5.2	60.6	3,610
December	29	8.0	14.0	861
January	8.0	.4	4.21	259
February	8.0	0	2.57	143
The period				5,190

Digitized by Google

CLEAR FORK OF BRAZOS RIVER NEAR CRYSTAL FALLS, TEX.

LOCATION.—Staff gage at Humble Oil & Refining Co.'s pumping plant 4 miles northeast of Crystal Falls, Stephens County, and 5 miles below mouth of Hubbard Creek.

DRAINAGE AREA.—5,690 square miles.

RECORDS AVAILABLE.—July, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 11,100 second-feet May 18 (gage height, 17.7 feet); no flow for several periods.

1928–29: Maximum discharge, 21,500 second-feet July 27, 1928 (gage height, 29.6 feet); no flow during several periods.

River reached about a 38.0-foot stage during 1900.

REMARKS.—Records good. Large part of ordinary flow diverted for municipal use and mining. Low-water flow partly regulated by dams above gage.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.0	586	14	14	3.7	26	20	24	476	0	5.8	0
2	2.4	223	*16	10	4.4	26	18	16	*252	740	5.1	0
3	1.8	171	18	9.3	*5.1	*22	26	9.3	164	98	4.4	0
4	1.2	*124	14	12	5.8	18	22	7.9	112	18	*10	0
5	.6	78	10	171	5.8	16	22	*6.2	407	7.9	16	0
6	.6	71	10	*37	4.4	14	18	4.4	979	40	5.1	0
7	0	61	14	33	4.4	14	*57	3.0	187	*194	1.8	0
8	0	50	14	26	5.1	14	105	3.0	109	145	0	0
9	0	40	*14	22	7.2	10	112	4.4	*85	510	0	1,630
10	0	28	14	37	*7.9	*9.3	28	5.1	61	1,830	0	3,170
11	2.4	*24	16	24	8.6	8.6	26	3.0	37	1,310	0	6,640
12	3.0	20	22	22	7.2	381	16	*14	28	386	0	4,990
13	5.8	16	24	*22	5.8	672	14	*6,250	20	152	0	5,260
14	*6.5	64	26	22	4.4	148	*24	3,300	14	*81	0	4,270
15	7.2	81	26	22	3.0	289	33	2,100	10	57	0	*2,440
16	5.8	28	*28	18	2.7	138	14	2,320	*8.2	33	0	1,620
17	5.8	22	30	18	*2.2	*118	10	3,190	6.5	22	0	980
18	4.4	*17	252	18	1.8	98	8.6	9,220	3.7	12	0	434
19	4.4	12	187	14	2.4	105	770	*4,910	2.7	8.6	0	586
20	4.4	8.6	78	*14	22	91	807	3,240	1.5	30	0	790
21	*3.7	33	30	14	26	50	*730	1,340	.6	183	0	760
22	3.0	24	26	10	28	18	376	1,550	0	95	0	*468
23	2.7	20	*22	10	30	18	183	542	0	646	0	175
24	1.2	16	18	10	*30	*16	91	202	0	267	0	95
25	.6	*13	*15	10	30	14	910	141	0	71	0	67
26	0	10	12	8.6	28	12	850	*149	0	50	0	57
27	0	10	9.3	*7.9	28	14	293	817	0	26	0	47
28	0	12	8.6	7.2	30	64	*120	3,180	0	*22	0	40
29	0	10	8.6	5.8	------	167	64	2,810	0	18	0	*34
30	0	14	*11	4.4	------	74	37	1,200	0	14	0	28
31	135	------	14	3.0	------	*47	------	1,690	------	*7.2	0	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	135	0	6.63	408
November	586	8.6	62.9	3,740
December	252	8.6	32.3	1,990
January	171	3.0	21.2	1,300
February	30	1.8	12.3	683
March	672	8.6	87.5	5,380
April	910	8.6	193	11,500
May	9,220	3.0	1,520	93,500
June	979	0	98.8	5,880
July	1,830	0	228	14,000
August	16	0	1.55	95
September	6,640	0	1,150	68,400
The year	9,220	0	286	207,000

* Estimated.

Digitized by Google

NORTH BOSQUE RIVER NEAR CLIFTON, TEX.

LOCATION.—Staff gage one-fourth mile above Gulf, Colorado & Santa Fe Railway bridge and 1¾ miles northwest of Clifton, Bosque County.
DRAINAGE AREA.—974 square miles.
RECORDS AVAILABLE.—November, 1923, to September, 1929.
EXTREMES.—Maximum discharge during year, about 26,500 second-feet Sept. (gage height, 16.8 feet); no flow for several periods.
1923–1929: Maximum discharge, that of Sept. 8, 1929; no flow during several periods.
REMARKS.—Records fair for low stages and poor for high stages. Railroad pumps about 100,000 gallons a day above dam and below gage.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Sept.
1	0.7	0.5	1.9	3.2	8.5	29	6.7	85	391	0.3	0
2	.7	.8	1.8	3.2	10	20	5.0	41	197	.2	0
3	.6	.9	1.8	3.2	8.5	12	5.0	27	127	.2	0
4	.6	1.0	1.8	4.1	9.4	12	4.1	20	85	.1	0
5	.6	1.0	1.8	6.7	8.5	11	3.2	16	71	2.4	0
6	.6	1.0	1.8	5.0	16	10	3.2	12	57	16	346
7	.4	1.1	1.9	16	6.7	10	3.2	10	49	12	127
8	.4	1.2	2.0	11	9.4	10	6.7	9.4	49	5.0	15,500
9	.4	1.2	2.0	9.4	5.0	6.7	1,080	10	36	2.8	706
10	.3	1.2	2.5	6.7	3.2	5.8	243	221	27	2.2	78
11	.3	1.2	6.7	6.7	3.2	6.7	78	78	22	1.8	20
12	.2	1.3	5.0	5.0	3.2	10	41	47	20	1.4	3.2
13	.2	1.3	5.0	3.2	3.2	594	3,850	146	12	1.1	2.7
14	.2	1.3	4.1	3.2	3.2	146	466	146	10	.8	1.9
15	.2	1.5	4.1	3.1	4.1	64	156	114	8.5	.4	1.7
16	.1	1.6	20	3.0	4.1	41	136	47	6.7	.3	1.6
17	.1	1.6	602	3.1	3.2	31	64	301	5.0	.2	1.4
18	0	1.8	305	3.2	3.1	23	41	269	3.2	.1	1.3
19	0	1.7	82	3.2	3.0	20	139	68	2.8	.1	1.2
20	0	1.7	39	3.1	3.0	18	2,650	71	2.5	0	1.1
21	0	1.7	23	3.2	3.2	16	136	39	2.2	0	1.0
22	0	1.8	16	3.1	3.2	27	64	23	1.9	0	1.0
23	0	1.8	12	3.2	3.2	20	41	14	1.7	0	.9
24	0	1.8	12	46	3.2	16	1,110	12	1.5	0	.8
25	0	1.8	10	145	74	14	1,360	557	1.4	0	.7
26	0	1.8	8.5	47	750	12	156	5,870	1.2	0	.7
27	0	1.8	8.5	27	114	10	78	518	1.0	0	.6
28	0	1.8	8.5	16	49	10	52	294	.7	0	.6
29	0	1.8	6.7	12	-------	8.5	68	262	.6	0	.6
30	.3	1.8	5.8	10	-------	8.5	92	371	.4	0	.5
31	.2	-------	5.0	8.5	-------	7.6	---------	980	-------	0	---------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	0.7	0	0.23	14
November	1.8	.5	1.43	85
December	602	1.8	39.0	2,400
January	145	3.0	13.8	848
February	750	3.0	39.9	2,220
March	594	5.8	39.7	2,440
April	3,850	3.2	405	24,100
May	5,870	9.4	344	21,200
June	391	.4	39.8	2,370
July	16	0	1.53	94
September	15,500	0	560	33,300
The year	15,500	0	123	89,100

NOTE.—No flow during August.

Digitized by Google

SOUTH BOSQUE RIVER NEAR SPEEGLEVILLE, TEX.

LOCATION.—Chain gage on highway bridge 2 miles south of Speegleville, McLennan County.

DRAINAGE AREA.—388 square miles.

RECORDS AVAILABLE.—March, 1924, to September, 1929.

EXTREMES.—Maximum discharge during year, about 5,480 second-feet May 28 (gage height, 11.10 feet); no flow during several periods.

1924–1929: Maximum discharge, determined by slope-area method, 54,500 second-feet June 14, 1927 (gage height, 29.37 feet, from floodmarks); no flow during several periods.

REMARKS.—Records fair for low and intermediate stages and poor for high stages. No diversions above station. No record Dec. 1 to Jan. 11 and Jan. 13 to Feb. 7.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.5			*6.2	44	56	642	15	1.0	0
2	0	.8			7.0	44	32	273	15	1.0	0
3	0	.3			6.0	36	10	236	13	.6	0
4	0	0			7.0	30	16	493	15	.8	0
5	0	0			7.0	19	28	236	26	.6	0
6	0	0			6.0	23	21	172	25	.6	47
7	0	0			5.0	25	14	202	19	.4	19
8	0	0		7.0	10	36	11	183	13	.2	1,050
9	0	0		5.0	7.0	70	17	157	10	.6	36
10	0	0		5.0	8.0	96	19	127	8.0	.5	9.0
11	0	0		7.0	13	16	13	106	7.0	.8	2.0
12	0	0	3.0	5.0	9.0	14	13	99	5.5	.7	1.9
13	0	0		3.5	154	207	202	86	5.0	.5	1.3
14	0	.1		3.0	93	58	39	77	5.0	.3	1.4
15	.2	0		4.0	74	50	25	70	4.0	.2	.9
16	.4	0		3.0	56	26	12	*66	3.0	.1	1.2
17	0	0		7.0	36	28	365	*62	2.0	.1	1.0
18	0	0		5.0	44	113	106	*57	1.8	.2	.9
19	0	0		6.0	424	83	67	53	1.8	.1	.8
20	0	0		6.0	67	215	39	42	1.6	.1	1.1
21	0	0		5.5	194	53	25	42	1.6	0	.9
22	0	0		5.5	77	28	25	36	1.1	0	.7
23	.4	.5		7.0	61	34	23	36	0	0	.8
24	0	7.0		7.0	58	39	308	34	0	0	.7
25	0	12		7.0	58	34	96	42	0	0	.9
26	.1	70		6.0	44	44	265	32	0	0	.9
27	.7	58		4.5	58	28	99	25	0	0	.9
28	.3	70		*5.4	50	21	2,240	25	0	0	.7
29	0	103			154	90	960	23	.8	0	.6
30	0	157			50	202	216	19	1.2	0	.8
31	.1				*47		493		1.2	0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	0.7	0	0.07	4.3
November	157	0	16.0	952
February 8–28	7.0	3.0	5.45	227
March	424	5.0	61.0	3,750
April	215	14	60.2	3,580
May	2,240	10	189	11,600
June	642	19	125	7,440
July	26	0	6.50	400
August	1.0	0	.30	18
September	1,050	0	39.4	2,340

* Estimated.

Digitized by Google

LEON RIVER NEAR HAMILTON, TEX.

LOCATION.—Chain gage on St. Louis Southwestern Railway bridge 6 miles north of Hamilton, Hamilton County.

DRAINAGE AREA.—1,900 square miles.

RECORDS AVAILABLE.—January, 1925, to September, 1929.

EXTREMES.—Maximum discharge during year, 4,480 second-feet Sept. 8 (gage height, 17.20 feet); no flow during several periods.

1925–1929: Maximum discharge, that of Sept. 8, 1929; no flow during several periods.

A stage of 29.8 feet occurred in May, 1908.

REMARKS.—Records fair. No large diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Sept.
1	0.7	0.7	17	38	59	249	40	182	1,050	2.0	0
2	.6	3.3	17	28	59	192	40	97	1,050	2.0	0
3	.5	2.9	17	28	51	92	40	71	1,020	1.8	0
4	.4	2.3	17	28	43	92	36	58	930	1.8	0
5	.3	2.2	17	28	43	84	33	42	411	1.8	0
6	.1	1.7	15	57	43	67	33	38	296	1.8	0
7	0	1.4	15	878	43	60	33	32	136	9.2	0
8	1.3	1.0	15	1,050	39	52	74	29	111	3.5	2,910
9	5.2	.9	21	1,160	39	44	497	31	79	2.2	2,150
10	25	.7	22	548	36	33	500	29	57	1.7	796
11	14	.5	45	232	36	29	411	31	43	1.1	170
12	11	.4	49	158	36	52	221	43	32	1.0	106
13	3.8	.2	58	121	32	81	664	71	24	.9	45
14	2.8	.2	67	92	32	352	2,050	32	18	.9	22
15	2.0	.2	58	75	32	296	2,450	124	12	.4	7.0
16	1.8	.2	54	63	32	208	1,380	208	11	0	5.2
17	1.6	.2	228	51	32	147	543	88	9.6	0	3.2
18	1.0	.1	872	51	28	116	208	136	6.2	0	2.4
19	.9	.1	901	51	28	88	136	208	4.8	0	1.8
20	.7	.1	705	47	28	75	126	182	4.8	0	1.4
21	.6	.1	449	39	28	71	102	116	4.3	0	105
22	.4	.4	235	36	28	67	71	84	3.9	30	31
23	0	24	182	32	39	63	55	53	3.4	7.0	6.5
24	0	28	136	66	39	63	67	41	3.2	5.2	5.0
25	0	28	111	390	48	63	299	431	2.5	3.9	3.5
26	0	26	102	332	210	60	846	3,190	2.8	2.6	2.3
27	0	28	84	171	296	60	959	2,840	3.0	2.6	1.2
28	0	28	67	106	279	48	506	918	2.8	2.2	.8
29	0	28	47	75	-------	40	264	350	2.5	1.4	.7
30	0	20	44	63	-------	40	235	360	2.3	.1	.6
31	0	-------	39	63	-------	40	-------	988	---------	0	--------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	25	0	2.41	148
November	28	.1	7.66	455
December	901	15	152	9,350
January	1,160	28	199	12,200
February	296	28	62.1	3,450
March	352	29	97.5	6,000
April	2,450	33	431	25,600
May	3,190	29	358	22,000
June	1,050	2.3	178	10,600
July	30	0	2.81	173
September	2,910	0	213	12,700
The year	3,190	0	142	103,000

NOTE.—No flow during August.

49759—32——4

Digitized by Google

LEON RIVER NEAR BELTON, TEX.

LOCATION.—Staff gage a quarter of a mile above Temple-Belton highway bridge 2 miles east of Belton, Bell County.

DRAINAGE AREA.—3,550 square miles.

RECORDS AVAILABLE.—October, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, 11,400 second-feet May 29 (gage height, 9.32 feet); no flow Aug. 23 to Sept. 5.

1923–1929: Maximum discharge, about 27,100 second-feet Oct. 2, 1927 (gage height, 15.05 feet); no flow during several periods.

Highest known stages, 21.0 feet September, 1921, and about 25 feet December, 1913.

REMARKS.—Monthly records fair. Records of daily discharge not sufficiently accurate for publication. Several small pumping plants above gage; amount of water diverted not known.

Monthly discharge, in second-feet, 1928–29

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	18	1.0	7.06	434
November	17	1.2	7.15	425
December	646	10	93.3	5,740
January	935	42	183	11,300
February	147	42	64.8	3,600
March	610	70	231	14,200
April	3,220	70	564	34,800
May	7,200	70	1,200	73,800
June	1,870	42	488	29,000
July	40	12	21.5	1,320
August	10	0	3.20	197
September	4,160	0	568	33,800
The year	7,200	0	288	209,000

Digitized by Google

LITTLE RIVER NEAR LITTLE RIVER, TEX.

LOCATION.—Chain gage on Missouri-Kansas-Texas Railroad bridge 2 miles south of Little River, Bell County. Zero of gage, 400.32 feet above mean sea level.

DRAINAGE AREA.—5,250 square miles.

RECORDS AVAILABLE.—October, 1923, to May, 1929, when station was discontinued.

EXTREMES.—Maximum discharge during period of current year, 9,120 second-feet May 27 (gage height, 33.40 feet); minimum, 20 second-feet Oct. 26 (gage height, 3.08 feet).

1923–1929: Maximum discharge, 28,400 second-feet Oct. 2, 1927 (gage height, 43.3 feet); minimum, 8.9 second-feet Aug. 12, 1925 (gage height, 3.26 feet).

River reached a stage of 50.85 feet September, 1921.

REMARKS.—Records fair. Several small diversions above station; amount diverted not known. Waterworks on Leon River may regulate flow at extremely low stages.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
1	51	24	38	80	208	86	188	635
2	47	23	38	74	197	86	180	585
3	43	23	37	64	172	111	172	1,180
4	42	25	36	69	172	263	163	920
5	40	26	35	69	154	263	172	263
6	38	29	34	64	139	230	163	241
7	36	29	37	200	125	180	188	219
8	34	30	36	154	118	154	1,040	188
9	31	31	38	118	111	132	1,820	188
10	31	31	60	111	104	118	548	188
11	28	34	51	630	98	180	263	188
12	28	33	43	894	91	332	263	219
13	26	33	41	1,080	91	1,000	1,790	1,260
14	26	28	37	555	91	782	2,180	a 760
15	26	30	36	311	91	535	965	263
16	26	33	317	230	91	485	790	208
17	27	36	156	197	86		842	241
18	26	30	86	172	86	a 400	972	1,270
19	23	28	64	146	86		2,520	492
20	22	26	56	139	86	219	532	263
21	22	29	56	118	98	219	275	230
22	22	32	51	111	91	163	252	208
23	21	31	221	98	91		323	230
24	20	31	660	91	86		230	712
25	20	30	560	86	86	a 200	208	660
26	20	31	485	86	91		188	1,940
27	22	43	385	80	91	219	172	5,950
28	22	45	299	74	91	219	208	------
29	22	40	172	168	------	197	312	------
30	23	38	111	323	------	188	1,360	------
31	24	------	104	219	------	197	------	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	51	20	28.7	1,760
November	45	23	31.1	1,850
December	660	34	141	8,670
January	1,080	64	220	13,500
February	208	86	112	6,220
March	1,000	86	276	17,000
April	2,520	163	643	38,300
May 1-27	5,950	188	730	39,100
The period	------	------	------	126,000

a Estimated.

Digitized by Google

LITTLE RIVER AT CAMERON, TEX.

LOCATION.—Chain gage on highway bridge three-fourths mile above Gulf, Colorado & Santa Fe Railway bridge and 2 miles southeast of Cameron, Milam County.

DRAINAGE AREA.—7,030 square miles.

RECORDS AVAILABLE.—November, 1916, to September, 1929.

EXTREMES.—Maximum discharge during year, about 137,900 second-feet May 29 (gage height, 40.70 feet); minimum, 32 second-feet Oct. 25–31.

1916–1929: Maximum discharge, by slope-area method, 647,000 second-feet Sept. 10, 1921 (gage height, about 53.8 feet present datum, and 49.5 feet on staff gage half a mile upstream in use during 1921); minimum, 2.6 second-feet Sept. 3, 5, and 7, 1918.

REMARKS.—Records fair. Numerous small diversions for irrigation and municipal uses affect flow at station only during extremely low stages. About 2,500 acres irrigated above station. Slight regulation by pumping above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	119	37	53		373	144	214	2,060	16,300	422	236	*94
2	90	35	*48		602	135	*209	2,530	*11,100	422	204	91
3	77	33	42		*572	*140	204	1,730	*5,130	822	193	89
4	77	*35	42	*300	*422	144	193	790	3,880	*854	*178	90
5	71	37	52		296	236	183	*542	5,520	694	163	87
6	60	46	52		259	334	183	452	3,600	632	153	87
7	*60	46	52		225	308	173	334	3,250		153	87
8	60	44	47	308	*215	283	625	308	2,950		153	2,800
9	60	46	*47	*278	*204	248	10,400	259	*2,320		144	5,340
10	54	46	47	248	*193	*254	14,800	236	1,690		144	5,900
11	54	*44	75	214	183	259	4,970	225	1,390		*144	2,080
12	54	41	57	183	163	236	1,350	*214	1,220		144	1,280
13	49	41	69	*526	163	2,460	3,160	204	1,110		135	2,320
14	*46	40	75	950	163	2,440	*5,960	2,460	982		130	2,440
15	44	41	75	726	163	1,330	6,980	1,810	950	*450	127	*984
16	44	41	77	452	153	822	5,070	662	*918		125	602
17	44	41	538	348	*148	*542	*2,230	482	886		125	422
18	39	*41	775	296	144	422	1,480	1,720	758		*123	334
19	39	41	359	259	144	422	2,190	*2,900	694		121	283
20	37	41	*193	*242	*140	542	2,780	2,840	662		118	236
21	*37	40	144	225	135	632	*1,690	632	632		113	225
22	37	40	119	193	129	886	1,110	512	602	283	113	*199
23	35	40	118	173	144	982	*918	407	*572	248	113	173
24	33	40	*154	163	*148	*662	790	1,240	542	225	109	144
25	32	*40	*662	153	153	452	726	6,160	512	204	*104	135
26	32	41	542	153	153	362	*662	8,570	572	259	98	144
27	32	41	377	*141	135	321	*602	13,200	632	225	106	135
28	*32	43	308	129	144	283	*542	29,600	482	*308	103	130
29	32	43		129	------	283	*452	122,000	482	392	101	*124
30	32	43	*275	129	------	259	482	61,800	*452	283	98	119
31	32	------		173	------	*236	------	31,700	------	248	98	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	119	32	49.8	3,060
November	46	33	40.9	2,430
December	775	42	194	11,900
January	950	129	287	17,600
February	602	129	217	12,100
March	2,460	135	550	33,800
April	14,800	173	2,380	142,000
May	122,000	204	9,630	592,000
June	16,300	452	2,360	140,000
July	854	204	428	26,300
August	236	98	134	8,240
September	5,900	87	906	53,900
The year	122,000	32	1,440	1,040,000

* Estimated.

Digitized by Google

LAMPASAS RIVER AT YOUNGSPORT, TEX.

LOCATION.—Staff gage half a mile northeast of Youngsport, Bell County.
DRAINAGE AREA.—1,240 square miles.
RECORDS AVAILABLE.—February, 1924, to September, 1929.
EXTREMES.—Maximum discharge during year not determined (gage height, 14.00 feet Sept. 7); minimum, 0.7 second-foot Aug. 23–28 and Sept. 1–5 (gage height, 2.58 feet).
1924–1929: Maximum discharge not determined (gage height, 23.70 feet Oct. 2, 1927); no flow July 17 to Aug. 18, 1925.
REMARKS.—Records fair. Daily discharge not sufficiently accurate for publication. Small amount of water diverted for municipal uses.

Monthly discharge, in second-feet, 1928–29

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	19	6.0	8.75	538
November	33	13	19.8	1,180
December	33	20	26.0	1,600
January	174	10	27.3	1,680
February	23	12	15.4	855
March	499	10	58.2	3,580
April	1,540	17	117	6,960
May	2,230	15	266	16,400
June	530	19	118	7,020
July	270	5.1	28.2	1,730
August	5.6	.7	1.96	120
September	7,410	.7	514	30,600
The year	7,410	.7	99.8	72,300

Digitized by Google

SAN GABRIEL RIVER AT CIRCLEVILLE, TEX.

LOCATION.—Chain gage on highway bridge half a mile southeast of Circleville Williamson County, and half a mile above Missouri-Kansas-Texas Railroad bridge.

DRAINAGE AREA.—602 square miles.

RECORDS AVAILABLE.—February, 1924, to September, 1929.

EXTREMES.—Maximum discharge during year, about 53,400 second-feet May 29 (gage height, 34.20 feet); minimum, 4.4 second-feet Oct. 20, 21, 23, 25, 26, and 28.

1924–1929: Maximum discharge, that of May 29, 1929; no flow Sept. 5, 6, 8, and 11, 1924.

The river reached a stage of about 40.6 feet September, 1921.

REMARKS.—Records fair. Several small diversions for municipal uses above station; amount diverted not known.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.0	6.0	16	14	23	16	20	27	620	*90	38	13
2	6.0	7.0	14	*13	51	16	20	26	459	88	38	16
3	6.0	4.6	14	12	25	16	20	24	370	90	38	16
4	6.5	5.5	14	14	18	18	20	24	328	98	36	13
5	6.5	8.5	14	47	18	15	20	19	308	95	36	11
6	6.5	15	*15	22	15	15	20	19	268	85	31	11
7	*6.8	11	16	22	14	15	19	19	258	88	*30	13
8	7.0	9.0	14	23	15	15	1,180	*22	238	83	30	13
9	7.0	9.0	15	21	11	15	343	24	228	78	30	13
10	7.0	9.0	21	19	12	15	208	24	208	73	31	11
11	7.0	8.0	24	23	14	39	98	24	190	71	27	11
12	6.0	9.0	23	19	14	61	62	26	173	69	27	12
13	7.5	9.0	20	16	15	57	1,010	768	156	69	25	14
14	*7.5	9.0	14	16	15	45	741	96	164	69	*22	28
15	7.5	10	14	14	14	*38	150	45	156	64	20	17
16	9.5	10	48	15	14	31	61	45	148	62	19	16
17	14	13	31	16	12	27	49	36	140	62	19	14
18	7.5	11	20	15	14	29	45	342	133	*58	19	13
19	4.6	10	21	16	15	31	43	79	126	54	19	11
20	4.4	*10	15	15	14	438	43	40	119	126	19	11
21	4.4	11	15	16	14	55	38	30	119	73	19	11
22	4.8	10	14	16	15	36	36	28	119	64	18	10
23	4.4	11	14	16	15	31	34	33	*112	55	18	11
24	4.8	11	13	15	15	22	36	456	105	53	18	10
25	4.4	11	13	15	18	23	*35	4,080	98	51	16	10
26	4.4	11	13	14	15	*22	34	2,840	105	54	*16	10
27	4.8	16	11	*14	15	22	31	156	98	*59	15	10
28	4.4	15	11	14	15	22	31	491	93	64	16	11
29	6.0	16	12	15	-------	25	31	24,600	95	47	16	10
30	7.0	14	14	14	-------	23	31	4,120	93	49	16	9.5
31	6.0	-------	14	14	-------	11	-------	1,940	-------	41	16	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	14	4.4	6.33	389
November	16	4.6	10.3	613
December	48	11	17.0	1,050
January	47	12	17.3	1,060
February	51	11	16.6	922
March	438	11	40.1	2,470
April	1,180	19	150	8,930
May	24,600	19	1,310	80,600
June	620	93	194	11,500
July	126	41	70.4	4,330
August	38	15	23.8	1,460
September	28	9.5	12.6	750
The year	24,600	4.4	157	114,000

* Estimated.

Digitized by Google

YEGUA CREEK NEAR SOMERVILLE, TEX.

LOCATION.—Chain gage on Gulf, Colorado & Santa Fe Railway bridge 2 miles south of Somerville, Burleson County. Gage reading gives distance from base of rail to water surface.

DRAINAGE AREA.—990 square miles.

RECORDS AVAILABLE.—May, 1924, to September, 1929.

EXTREMES.—Maximum discharge during year, about 33,600 second-feet May 30 (gage height, −17.02 feet); no flow during several periods.

1924–1929: Maximum discharge, that of May 30, 1929; no flow during several periods.

REMARKS.—Monthly records fair. Records of daily discharge not sufficiently accurate for publication. No diversions above station. Flow partly regulated by swamp upstream.

Monthly discharge, in second-feet, 1928–29

Month	Maximum	Minimum	Mean	Run-off in acre-feet
November	166	0	6.91	411
December	2,180	1.1	354	21,800
January	286	2.3	31.6	1,940
February	14	1.6	4.88	271
March	330	1.0	57.4	3,530
April	6,050	4.8	844	50,200
May	29,500	9.9	2,430	149,000
June	11,200	7.6	1,100	65,500
July	899	4.5	144	8,850
August	6.2	0	1.56	96
The year	29,500	0	418	302,000

NOTE.—No flow during October and September.

Digitized by Google

NAVASOTA RIVER NEAR EASTERLY, TEX.

LOCATION.—Inverted staff gage at International-Great Northern Railroad bridge 6 miles northeast of Easterly, Robertson County. Zero of gage, 301.24 feet above mean sea level. Gage readings show distance from base of rail to water surface.

DRAINAGE AREA.—949 square miles.

RECORDS AVAILABLE.—March, 1924, to September, 1929.

EXTREMES.—Maximum and minimum discharge during year not determined.

1924–1929: Maximum discharge not determined (gage height, —5.5 feet May 30, 1929); no flow during several periods.

REMARKS.—Records poor. No diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.8	166	112	*46	582	*112	59	1,160	12,800	59	32	*0.3
2	2.8	239	81	44	562	*112	112	1,120	10,800	44		.3
3	2.8	188	54	44	*486	*112	89	503	9,740	44		.3
4	2.8	104	28	44	411	112	74	157	5,390	84		.3
5	2.8	69	19	44	301	112	64	69	2,090	124		.3
6	2.8	59	16	*44	248	106	64	59	1,180	163		.3
7	*2.8	44	16	76	198	94	*88	49	708	*140		.3
8	2.8	25	14	1,030	163	89	112	44	373	118		.3
9	2.8	19	*16	2,160	136	69	142	368	184	84		.3
10	2.8	16	19	1,900	*118	*64	184	1,100	136	79		.3
11	2.8	*14	25	1,240	100	59	348	770	118	64	*8.0	.3
12	2.8	12	75	748	74	113	396	682	106	44		.3
13	2.8	9.6	465	403	74	746	738	2,250	106	36		.3
14	*3.2	9.6	428	214	69	1,040	2,120	4,860	100	*32		.3
15	*3.7	9.6	469	149	64	1,040	2,700	5,120	257	28		*.8
16	*4.1	8.0	1,890	112	59	1,130	2,260	3,800	*224	25		1.2
17	*4.6	8.0	5,930	94	*52	668	1,580	3,060	191	25		5.0
18	5.0	*8.0	5,390	94	64	311	1,160	2,800	136	22		3.8
19	5.0	8.0	4,430	94	69	170	731	2,800	100	22		3.8
20	5.0	8.0	2,930	*132	74	130	362	2,800	89	19		2.8
21	*4.4	8.0	1,880	170	89	149	147	2,450	69	*18	.3	2.0
22	3.8	8.0	954	156	106	163	79	1,830	59	16	*.3	*2.0
23	3.8	8.0	582	112	112	124	64	906	*54	16	*.3	2.0
24	2.8	8.0	502	94	*112	*118	59	905	49	14	.3	2.0
25	2.8	*14	311	124	112	112	59	1,400	49	14	*.3	2.0
26	2.8	19	141	156	112	79	59	682	69	11	.3	1.2
27	2.8	25	64	395	*112	69	59	726	100	32	.3	1.2
28	*2.8	53	59	920	*112	64	*56	2,330	124	*46	.3	1.2
29	2.8	100	54	770	-------	64	54	15,900	79	59	.3	*1.2
30	3.8	112	*52	662	-------	59	163	21,300	*69	106	.3	1.2
31	33	-------	49	602	-------	*59	-------	16,900	--------	54	.3	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	33	2.8	4.31	265
November	239	8.0	46.0	2,740
December	5,930	14	873	53,700
January	2,160	44	415	25,500
February	582	52	170	9,440
March	1,130	59	240	14,800
April	2,700	54	473	28,100
May	21,300	44	3,190	196,000
June	12,800	49	1,520	90,400
July	163	11	53.0	3,260
August	----------	----------	6.04	371
September	5.0	.3	1.25	74
The year	21,300	.3	587	425,000

* Estimated.

Digitized by Google

COLORADO RIVER BASIN

COLORADO RIVER AT BALLINGER, TEX.

LOCATION.—Staff gage two-thirds of a mile below Gulf, Colorado & Santa Fe Railway bridge at Ballinger, Runnels County.

DRAINAGE AREA.—16,800 square miles, large part of which is probably non-contributing.

RECORDS AVAILABLE.—December, 1915, to September, 1929.

EXTREMES.—Maximum discharge during year, 26,300 second-feet May 26 (gage height, 23.80 feet); minimum, 0.8 second-foot Sept. 1–4.

1915–1929: Maximum discharge, 29,300 second-feet July 27, 1928 (gage height, 25.3 feet); no flow during several periods.

REMARKS.—Records fair for low and medium stages and poor for high stages. During periods of heavy local rains, backwater from small creek below gage may affect records for short periods. About 6,900 acres has been declared irrigated above station; during low stages the diversions are a large part of the total flow.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	124	12	9.0	9.0	24	27	59	202	4.0	33	0.8
2	21	83	11	9.0	9.0	22	28	40	156	6.5	22	.8
3	21	28	10	9.0	9.0	16	68	27	338	3.0	18	.8
4	20	26	10	9.0	9.0	14	55	22	270	2.8	13	.8
5	18	59	8.0	9.0	10	13	44	18	492	169	9.0	.9
6	18	49	9.0	9.0	10	11	38	12	270	278	3.5	47
7	16	37	10	9.0	10	11	38	10	164	3,370	2.6	56
8	15	33	10	8.0	12	11	47	7.0	118	745	2.0	90
9	14	27	9.0	12	15	11	35	823	96	261	1.4	32
10	12	21	11	18	15	9.0	35	1,980	75	146	1.0	2,050
11	12	20	13	35	12	11	27	926	66	75	1.0	3,800
12	10	18	12	24	9.0	1,110	24	340	64	53	1.0	8,360
13	10	17	12	17	10	1,650	30	281	80	40	1.0	2,000
14	11	980	12	14	9.0	228	26	144	47	32	1.0	713
15	10	290	12	14	9.0	291	24	80	42	26	1.0	386
16	8.0	54	37	13	9.0	228	17	470	44	35	1.0	245
17	7.0	24	18	13	9.0	102	13	401	30	27	1.0	240
18	7.0	15	64	15	9.0	47	12	2,900	28	32	1.0	156
19	7.0	12	*43	16	9.0	42	10	3,760	26	20	1.0	311
20	6.5	12	22	16	13	46	7.5	1,160	21	118	1.0	295
21	7.0	14	17	14	16	203	6.0	582	16	35	1.0	186
22	7.0	11	13	13	16	321	6.0	361	13	14	.9	140
23	6.5	9.0	13	14	15	338	5.5	253	10	8.0	.9	104
24	6.5	11	12	14	15	190	699	2,350	7.5	126	.9	75
25	6.5	10	12	12	18	104	209	5,290	6.5	361	.9	73
26	6.0	12	12	11	42	66	49	21,100	6.5	382	.9	51
27	6.5	14	11	10	26	47	32	9,730	4.5	244	.9	46
28	6.0	14	10	10	20	47	158	1,080	4.0	88	1.0	40
29	6.0	13	10	10	-------	40	113	582	4.0	47	.9	35
30	12	12	11	10	-------	33	91	386	4.5	57	.8	28
31	32	-------	11	10	-------	30	-------	266	-------	*45	.8	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	32	6.0	11.9	732
November	980	9.0	68.3	4,060
December	64	8.0	15.4	947
January	35	8.0	13.1	806
February	42	9.0	13.4	744
March	1,650	9.0	171	10,500
April	699	5.5	65.8	3,920
May	21,100	7.0	1,790	110,000
June	492	4.0	90.2	5,370
July	3,370	2.8	221	13,600
August	33	.8	4.05	249
September	8,360	.8	652	38,800
The year	21,100	.8	262	190,000

* Estimated.

Digitized by Google

COLORADO RIVER NEAR MILBURN, TEX.

LOCATION.—Combination staff and chain gage at steel highway bridge 1½ miles northwest of Milburn, McCullough County.

DRAINAGE AREA.—24,600 square miles, large part of which is probably noncontributing.

RECORDS AVAILABLE.—November, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, about 28,400 second-feet May 26 (gage height, 31.2 feet); no flow Aug. 8–10 and Sept. 1–5.

1923–1929: Maximum discharge, about 35,100 second-feet Apr. 23, 1926 (gage height, 36.1 feet); no flow Aug. 8–10 and Sept. 1–5, 1929.

REMARKS.—Records fair. About 18,000 acres has been declared irrigated above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	236	60				172	129	*1,220	1,080	13	41	0
2	175	85				127	120	456		13	21	0
3	137	122			*52	96	108	361		2,320	13	0
4	108	219				78	96	269		1,350	8.2	0
5	92	158				70	92	236		236	5.2	0
6	74	122			52	66	83	189		150	2.7	1,110
7	65	98			50	63	137	110		89	.5	3,330
8	63	78			51	57	2,640	92		4,040	0	4,880
9	57	115			51	48	3,380	352		1,440	0	1,920
10	57	98			52	50	2,060	2,390		580	0	527
11	55	89			51	46	1,000	1,740		322	6.4	158
12	51	79			55	47	342	1,000	*100	920	6.7	3,580
13	50	72			54	45	252	720		555	6.5	3,990
14	44	66			54	2,120	207	515		252	6.2	1,810
15	42	111			60	404	371	322		186	6.0	957
16	41	863	*76	*60	62	322	355	1,040		139	5.7	650
17	35	342			58	322	124	1,450		110	5.4	486
18	33	195			57	269	105	1,470		76	5.2	361
19	33	145			55	178	96	4,030		46	4.9	342
20	33	108			65	178	87	3,740		28	4.7	322
21	33	94			62	252	78	1,520		17	4.4	322
22	31	83			62	236	72	790		13	4.0	304
23	31	78			63	404	68	486	28	11	3.6	286
24	31	66			60	456	66	361	26	10	3.1	286
25	27	62			54	456	124	6,780	23	9.4	2.6	269
26	26	60			52	361	279	24,900	22	8.2	2.1	252
27	30	65			534	252	269	27,500	20	7.0	1.8	236
28	28	66			269	198	201	11,600	19	13	1.4	219
29	28	65			------	*180	*183	3,870	16	209	.9	213
30	39	62			------	*163	*6,930	3,520	14	142	.5	201
31	40	------			------	145	------	3,100	------	96	.1	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	236	26	58.9	3,620
November	863	60	131	7,800
December	------	------	76	4,670
January	------	------	60	3,690
February	534	------	80.1	4,450
March	2,120	45	254	15,600
April	6,930	66	668	39,700
May	27,500	92	3,420	210,000
June	1,080	14	112	6,660
July	4,040	7.0	432	26,600
August	41	0	5.61	345
September	4,880	0	900	53,600
The year	27,500	0	521	377,000

* Estimated.

Digitized by Google

COLORADO RIVER NEAR TOW, TEX.

LOCATION.—Water-stage recorder at highway bridge 1¼ miles northeast of Tow, Llano County.

DRAINAGE AREA.—31,100 square miles, large part of which is probably noncontributing.

RECORDS AVAILABLE.—October, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, 35,000 second-feet May 29 (gage height, 17.40 feet); minimum, 34 second-feet Sept. 4–5 (gage height, 5.15 feet).

1923–1929: Maximum discharge, that of May 29, 1929; minimum, 24 second-feet Jan. 10, 1925 (gage height, 5.00 feet).

Highest known stage, 28.4 feet (on present gage) April, 1900.

REMARKS.—Records good except those for estimated periods, which are fair. Numerous small diversions above station; amount diverted not known.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,440	225	163	139	171	814	277	7,040	10,400	94	299	36
2	1,010	229	167	129	179	611	250	2,710	4,220	86	205	36
3	788	293	171	126	175	456	229	1,560	1,840	88	175	36
4	497	277	179	239	167	368	205	921	• 1,580	92	144	35
5	504	225	175	322	175	304	187	641	• 1,850	610	115	36
6	560	220	175	239	179	250	175	490	2,780	696	103	2,770
7	424	310	183	810	171	225	171	368	1,840	393	90	8,800
8	350	316	187	523	163	201	159	310		271	81	6,110
9	310	271	187	350	167	171	570	293		965	72	8,560
10	282	239	205	277	163	159	5,200	266	• 922	2,700	64	4,160
11	255	215	225	229	159	159	3,130	654		1,170	60	1,720
12	234	191	234	225	151	187	1,830	2,340		704	58	987
13	210	191	244	229	148	205	3,040	2,300		490	57	2,320
14	201	201	250	225	151	201	1,450	1,470	437	374	57	8,060
15	183	196	282	215	163	1,450	2,940	930	380	310	56	4,180
16	183	179	234	196	163	1,430	878	776	327	250	52	1,520
17	163	247	250	179	167	713	552	1,040	282	205	69	987
18	171	1,020	229	191	159	504	456	1,320	250	167	69	696
19	167	657	1,640	187	151	418	456	3,200	234	139	56	696
20	163	470	686	191	148	418	327	3,080	205	115	52	746
21	155	362	374	179	163	463	288	4,310	183	106	48	476
22	151	288	293	171	191	1,290	244	2,440	159	113	45	399
23	148	250	293	175	183	1,370	220	1,470	144	98	42	356
24	142	210	244	171	167	1,180	215	1,670	129	101	40	430
25	136	191	225	159	179	1,230	215	2,150	123	98	39	356
26	136	179	215	319	175	866	420	7,360	123	90	39	
27	126	171	187	399	175	688	1,110	18,000	115	90	38	
28	120	151	171	282	590	531	596	25,100	110	142	40	• 235
29	120	148	163	215	------	424	641	32,300	103	142	40	
30	129	155	148	187	------	350	4,460	21,700	101	115	39	
31	155	------	142	179	------	310	------	14,300	------	338	37	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,440	120	310	19,100
November	1,020	148	276	16,400
December	1,640	142	275	16,900
January	810	126	247	15,200
February	590	148	182	10,100
March	1,450	159	579	35,600
April	5,200	159	1,030	61,300
May	32,300	266	5,240	322,000
June	10,400	101	1,110	66,000
July	2,700	86	366	22,500
August	299	37	76.8	4,720
September	8,800	35	1,860	111,000
The year	32,300	35	968	701,000

• Estimated.

Digitized by Google

COLORADO RIVER AT AUSTIN, TEX.

LOCATION.—Water-stage recorder at Congress Avenue viaduct in Austin, Travis County. Zero of gage, 431.77 feet above mean sea level.

DRAINAGE AREA.—38,200 square miles, part of which is probably noncontributing.

RECORDS AVAILABLE.—February, 1898, to September, 1929.

EXTREMES.—Maximum discharge during year, 132,000 second-feet May 29 (gage height, 27.35 feet); minimum, 86 second-feet some time during period Aug. 30 to Sept. 7.

1898–1929: Maximum discharge, about 236,000 second-feet a few minutes after failure of Austin Dam Apr. 7, 1900 (gage height, 33.5 feet). At time of failure practically at crest of flood, depth of water over dam was 11.07 feet (computed discharge, 151,000 second-feet). Minimum discharge, 13 second-feet Aug. 18, 1918.

REMARKS.—Records good. About 36,000 acres has been declared irrigated above station. Flow at low stages affected by diversions of the city of Austin pumping plant.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5,220	250	332	360	374	313	702	840	22,300	290	236	
2	3,120	235	346	307	367	240	550	4,560	16,900	285	224	
3	2,080	203	339	339	367	395	510	6,000	11,000	347	232	
4	1,520	235	353	404	367	900	446	3,070	6,820	673	249	
5	1,180	289	307	668	360	825	404	2,140	4,840	1,880	307	*97
6	885	353	353	404	353	679	360	1,520	4,280	1,610	267	
7	714	429	346	1,310	325	591	381	1,040	4,000	3,860	236	
8	613	446	339	994	374	472	525	798	4,560	2,400	200	*8,730
9	657	381	346	762	307	446	1,840	690	3,860	1,560	182	11,500
10	624	360	395	960	260	339	702	530	3,300	1,010	168	9,560
11	463	429	367	855	283	404	480	560	*2,900	772	150	8,580
12	446	429	388	657	277	412	4,190	530	*2,450	2,840	140	4,700
13	420	360	412	540	307	395	3,960	762	*1,990	2,310	134	3,100
14	360	374	412	446	283	463	3,220	1,560	1,690	1,580	128	2,090
15	325	325	420	446	307	454	4,520	2,930	1,510	1,120	119	3,260
16	346	360	463	367	240	446	2,900	2,280	1,270	852	114	7,940
17	353	388	520	374	250	480	3,490	1,730	1,120	684	114	4,420
18	295	353	480	429	260	1,690	2,050	1,690	972	548	112	2,720
19	*283	353	510	360	307	1,460	1,220	1,780	820	516	109	1,880
20	*271	346	412	367	250	1,150	960	1,540	712	461	109	1,360
21	*325	840	520	307	255	1,060	900	2,960	600	642	106	972
22	*313	774	1,350	313	307	885	1,150	3,460	537	548	105	936
23	240	657	960	307	271	798	750	4,480	486	340	103	852
24	250	540	714	353	313	945	646	4,940	452	285	102	628
25	235	480	580	313	374	1,670	657	4,770	396	272	102	478
26	235	404	560	289	307	1,670	520	7,320	354	375	101	410
27	250	367	500	339	325	1,710	438	5,230	334	1,050	101	427
28	240	353	463	289	301	1,460	429	62,900	340	1,030	99	403
29	245	374	463	289	------	1,200	429	96,400	285	526	*97	364
30	230	367	404	381	------	930	930	51,200	312	382	*97	312
31	199	------	429	490	------	810	------	45,700	------	290		------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	5,220	199	740	45,500
November	840	203	402	23,900
December	1,350	307	477	29,300
January	1,310	289	484	29,800
February	374	240	310	17,200
March	1,710	240	829	51,000
April	4,520	360	1,340	79,700
May	96,400	530	10,500	646,000
June	22,300	285	3,380	201,000
July	3,860	272	1,010	62,100
August	307	----------	150	9,220
September	11,500	----------	2,540	151,000
The year	96,400	----------	1,860	1,350,000

* Estimated.

Digitized by Google

EVAPORATION NEAR AUSTIN, TEX.

LOCATION.—At reservoir on Hill ranch, 5 miles southeast of Austin, Travis County. Elevation, 475 feet above sea level.

RECORDS AVAILABLE.—April, 1916, to September, 1929.

EQUIPMENT.—Two evaporation pans—one pan floating on surface of reservoir and the other on land 30 feet from reservoir. Auxiliary equipment consists of hook gage, rain gage, anemometer, maximum and minimum thermometers, and psychrometer.

REMARKS.—Reservoir is 250 feet long and 30 feet wide. Moss and weed growth in reservoir may at times affect results. Records from land pan more accurate than those from floating pan. Observations made daily at 8 a. m. Computations made by United States Weather Bureau.

Evaporation near Austin, Tex., 1928–29

Month	Temperature (° F.)					Mean relative humidity (per cent)[a]	Wind		Rainfall, inches	Evaporation (inches)	
	Air			Water			Average velocity (miles an hour)	Prevailing direction		Floating pan	Land pan
	Mean maximum	Mean minimum	Mean	Floating pan (mean)	Land pan (mean)						
October	85.6	58.2	71.9	69.2	66.7	89	1.2	S.	0.36	4.128	5.259
November	67.5	44.7	56.1	54.8	52.2	82	2.1	N.	2.23	[b] 2.432	[b] 2.877
December	61.4	36.3	48.8	46.8	44.7	81	2.5	N.	3.06	[b] 1.639	[b] 2.150
January	61.2	35.9	48.6	45.9	48.5	86	2.8	S.	2.85	1.829	[b] 2.549
February	56.2[b]	32.8[a]	44.5[a]	47.1[e]	44.0[f]	88	4.3	N.	.47	1.563	2.130
March	73.5	49.4	61.4	60.6	56.7	83	2.5	SE.	4.26	[b] 4.102	[b] 4.708
April	80.4	58.6	69.5	69.4[a]	65.1	82	1.3	N.	3.70	[b] 4.088	[b] 4.960
May	84.2	62.2	73.2	72.2[a]	69.5	86	1.3	S.	14.26	[b] 5.234	[b] 6.474
June	92.1	68.7	80.4	78.9	75.5	86	.8	S.	1.45	[b] 6.055	[b] 7.752
July	91.7	70.4	81.0	80.1	76.8	89	.7	S.	3.19	5.464	7.199
August	97.2	69.6	83.4	79.9	75.8	81	.6	S.	.04	7.071	9.005
September	91.6	64.0	77.8	74.9	70.1	84	1.0	S.	1.18	[b] 5.199	[b] 6.807
The year	78.6	54.2	66.4	65.0	62.2	.....	1.8	S.	37.05	48.804	61.870

[a] Relative humidity figures given are for United States Weather Bureau, Austin, Tex.
[b] Estimated.

NOTE.—Letters following figures indicate number of days of missing record: a, 1 day; b, 2 days; c 3 days; etc.

Digitized by Google

COLORADO RIVER AT COLUMBUS, TEX.

LOCATION.—Water-stage recorder at county highway bridge in eastern edge of Columbus, Colorado County, and 400 feet below Galveston, Harrisburg & San Antonio Railway bridge.

DRAINAGE AREA.—40,800 square miles, large part of which is probably non-contributing.

RECORDS AVAILABLE.—January, 1903, to December, 1911, and May, 1916, to September, 1929.

EXTREMES.—Maximum discharge during year, 110,000 second-feet June 1 (gage height, 38.00 feet); minimum, 344 second-feet Nov. 5.

1903–1911, 1916–1929: Maximum discharge, that of June 1, 1929; minimum, 10 second-feet Sept. 9 and 10, 1910.

Stage of 44.6 feet was reached in 1869 and Dec. 6, 1913, when river divided into two channels and Columbus was left on an island.

REMARKS.—Records fair. About 36,000 acres has been declared irrigated above Austin.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,820	376	570	630	480	420	1,360	1,360	101,000	1,210	1,060	447
2	1,450	370	*550	630	480	420	1,210	1,000	70,000	1,150	880	432
3	1,910	362	534	630	492	*382	1,060	970	37,500	1,150	730	429
4	3,440	360	526	1,400	590	*368	1,000	1,180	20,800	1,090	655	429
5	2,480	346	514	3,210	590	*441	910	4,140	15,100	2,380	610	426
6	1,890	459	522	1,610	542	393	805	3,940	11,500	4,180	526	426
7	1,540	1,100	530	2,030	526	378	755	2,880	7,320	2,480	447	423
8	1,300	1,030	514	1,510	510	570	705	2,240	6,100	2,240	432	432
9	1,120	590	522	1,150	510	680	3,420	1,820	5,500	2,100	388	432
10	940	495	534	1,060	510	610	5,260	1,480	5,620	2,880	462	963
11	855	483	1,250	1,270	495	610	3,940	1,450	5,030	2,320	*655	7,380
12	*755	489	1,670	1,090	486	630	2,400	1,240	4,260	1,890	630	7,380
13	*755	480	3,480	1,000	492	1,060	24,000	3,090	3,840	1,540	*610	7,250
14		465	1,780	1,000	465	1,650	23,300	3,840	3,440	*1,640	570	5,140
15		462	1,000	940	435	2,200	9,730	2,560	2,960	*1,640	510	3,640
16	607	498	780	830	435	1,270	6,340	2,480	2,800	*2,030	504	2,880
17		480	1,610	730	435	910	4,810	5,010	2,560	1,720	477	2,240
18		477	2,030	705	435	705	3,840	11,000	2,400	1,480	471	5,050
19		465	1,180	680	438	630	3,440	7,390	2,170	*1,330	462	5,140
20	*459	450	1,120	*655	438	630	3,240	4,150	*2,030	*1,210	*462	3,240
21	*450	468	970	*610	438	4,170	*2,560	2,720	1,890	1,120	453	2,400
22	*438	465	780	*590	435	5,280	2,100	2,100	1,820	1,060	447	*1,960
23	*423	459	730	*570	435	2,880	1,820	1,890		1,030	444	1,680
24	*414	453	680	*534	435	2,170	1,610	3,220		1,030	444	1,450
25	*408	610	780	*504	435	1,540	1,640	7,570		1,030	*441	1,330
26	*396	730	1,120	483	429	1,240	1,480	8,760	*1,480	1,000	*441	1,300
27	*386	680	940	480	429	1,090	1,270	8,960		1,000	*441	*1,180
28	370	630	830	483	432	1,450	1,240	13,600		1,030	*447	*1,120
29	366	610	730	518	-------	1,720	1,750	47,800		910	456	*1,120
30	358	680	680	483	-------	1,680	1,420	84,000		855	441	1,090
31	352	-------	655	471	-------	1,610	--------	99,200	--------	1,120	441	-------

Month	Maximum	Miminum	Mean	Run-off in acre-feet
October	3,440	352	926	56,900
November	1,100	346	534	31,800
December	3,480	514	971	59,700
January	3,210	471	919	56,500
February	590	429	473	26,300
March	5,280	368	1,280	78,700
April	24,000	705	3,950	235,000
May	99,200	970	11,100	682,000
June	101,000	----------	10,900	649,000
July	4,180	855	1,580	97,200
August	1,060	388	530	32,600
September	7,380	423	2,290	136,000
The year	101,000	346	2,960	2,140,000

* Estimated.

Digitized by Google

CONCHO RIVER NEAR SAN ANGELO, TEX.

LOCATION.—Water-stage recorder half a mile below confluence of North Concho and South Concho Rivers and 1¼ miles southeast of San Angelo, Tom Green County.

DRAINAGE AREA.—4,490 square miles.

RECORDS AVAILABLE.—September, 1915, to September, 1929.

EXTREMES.—Maximum and minimum discharge for year not determined.

1915–1929: Maximum discharge, about 139,000 second-feet Apr. 26, 1922 (gage height, 36.8 feet); no flow Nov. 29, 1921.

REMARKS.—Records for low and medium stages good; for high stages fair. About 11,000 acres has been declared irrigated above station. Flow at low stages affected by diversions and storage above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45			40	25	36	51	180	46	1.7	1.8	
2	43			42	28	34	51	76	47	1.8	1.8	
3	44			41	33	26	53	51	52	1.8	1.7	*1.7
4	44			43	32	31	52	40	44	1.7	1.8	
5	43			38	33	28	46	32	34	1.6	1.8	
6	42			39	33	28	45	28	28	1.6	2.0	
7	39			43		23	59	26	20	2.0	2.0	
8	36			45		20	1,380	25	16	1.8	1.8	
9	33			67		20	430	1,480	12	1.6	1.8	*270
10	32	*53		54	*36	20	198	373	10	1.7	1.8	
11	32			43		25	108	128	5.8	1.8	1.8	
12	32			44	41	44	80	80	3.6	1.8	1.7	
13	33		*50	43	40	167	76	136	2.3	1.7	1.9	82
14	33			44	37	71	66	63	2.1	1.6	1.7	38
15	32			41	37	55	62	46	2.1	1.7	*1.7	20
16	32			39	33	46	67	53	2.1	1.6		14
17	28			32	28	45	66	46	2.1	1.6		10
18	31			32	22	48	59	46	2.0	1.7		6.7
19	30	*38		32	20	45	53	45	2.0	1.7		7.0
20	28	*32		28	28	586	45	39	2.0	15		5.4
21	30			31	30	758	45	38	2.1	4.7		3.8
22	26			38	33	188	38	36	2.1	2.6		3.3
23	28			37	28	99	36	58	2.0	2.1	*1.7	2.9
24	28			38	27	83	51	975	1.8	2.0		2.4
25	28			37	27	63	54	207	2.0	1.8		2.1
26	28	*40	*43	38	22	63	33	101	1.9	1.8		2.0
27	26		44	42	37	63	25	69	1.8	1.8		1.9
28	28		43	32	40	66	18	63	1.7	1.8		1.8
29	26		43	28	------	60	696	55	2.0	1.9		1.8
30	50		43	29	------	57	550	51	1.9	1.8		1.8
31		------	39	20	------	57	------	47	------	1.8		------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	----------	26	34.2	2,100
November	----------	----------	47.5	2,830
December	----------	----------	48.5	2,980
January	67	20	38.7	2,380
February	----------	20	31.9	1,770
March	758	20	95.3	5,860
April	1,380	18	153	9,100
May	1,480	25	151	9,280
June	52	1.7	11.8	702
July	15	1.6	2.31	142
August	----------	----------	1.75	108
September	----------	----------	79.1	4,710
The year	----------	----------	58.0	42,000

* Estimated.

Digitized by Google

CONCHO RIVER NEAR PAINT ROCK, TEX.

LOCATION.—Water-stage recorder at Concho, San Saba & Llano Valley Railroad bridge 2 miles northwest of Paint Rock, Concho County.

DRAINAGE AREA.—5,530 square miles.

RECORDS AVAILABLE.—September, 1915, to September, 1929.

EXTREMES.—Maximum discharge during year, 7,760 second-feet Sept. 6 (gage height, 8.55 feet); no flow July 19 and July 21 to Sept. 3.

1915–1929: Maximum discharge not determined (gage height, 27.5 feet Apr. 27, 1922); no flow during several periods.

REMARKS.—Records for low stages fair; high stages poor. About 11,000 acres has been declared irrigated, practically all above station. Flow during low stages materially affected by diversions and storage above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Sept.
1	59	84	52	40		34	57	445	59	0.1	0
2	52	103	52	38		37	54	181	55	.5	0
3	51	73	52	40		35	52	103	71	.4	0
4	49	59	55	41		34	52	75	59	.4	1.1
5	47	54	49	41		34	54	57	55	.3	43
6	47	52	47	1		33	51	47	46	.3	2,110
7	46	52	44	40	*36	31	85	40	35	7.7	1,610
8	46	52	46	38		30	1,880	35	30	1.7	258
9	43	49	54	46		30	1,340	1,570	24	1.0	
10	40	49	54	51		25	387	808	19	.7	*83
11	37	49	52	54		24	425	289	15	.6	
12	35	54	55	49		27	130	149	11	.4	23
13	35	57	55	46	*43	28	98	103	8.2	.4	15
14	35	55	54	44	44	96	84	127	6.0	.3	9.8
15	35	54	52	44	43	91	73	86	3.6	.3	45
16	35	54	55	44	40	63	69	63	2.0	.2	35
17	34	52	140	41	38	54	69	79	1.3	.2	57
18	33	49	86	40	37	51	71	79	1.0	.1	38
19	31	49	61	35	33	52	69	61	.7	0	16
20	31	46	51	33	31	55	63	54	.6	.1	11
21	34	44	47	31	31	807	54	49	.6	0	6.9
22	33	40	46	31	30	630	47	46	.4	0	4.7
23	30	40	46	31	31	229	46	44	.4	0	3.6
24	30	41	44	33	33	133	44	842	.4	0	3.6
25	30	40	43	37	34	103	43	740	.3	0	3.2
26	33	40	44	34	31	84	55	293	.3	0	2.8
27	33	43	43	34	31	73	51	137	.3	0	2.2
28	34	52	43	35	34	73	38	93	.2	0	1.8
29	33	57	41	34	-------	69	511	82	.2	0	1.6
30	34	55	41	33	-------	67	1,760	75	.2	0	1.5
31	46	-------	41	*30	-------	63	-------	67	-------	0	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	59	30	38.4	2,360
November	103	40	53.3	3,170
December	140	41	53.1	3,260
January	54	30	39.0	2,400
February	----------	----------	35.6	1,980
March	807	24	103	6,330
April	1,880	43	260	15,500
May	1,570	35	223	13,700
June	71	.2	16.9	1,010
July	7.7	0	.51	31
September	2,110	0	152	9,040
The year	2,110	0	81.2	58,800

* Estimated.

NOTE.—No flow during August.

Digitized by Google

NORTH CONCHO RIVER NEAR CARLSBAD, TEX.

LOCATION.—Water-stage recorder just above State Sanitorium Dam 2 miles above Carlsbad, Tom Green County.
DRAINAGE AREA.—1,530 square miles.
RECORDS AVAILABLE.—March, 1924, to September, 1929.
EXTREMES.—Maximum discharge during year, about 7,100 second-feet May 7 (gage height, 8.22 feet); no flow during several periods.
1924–1929: Maximum discharge, about 35,600 second-feet May 30, 1925 (gage height, 14.45 feet); no flow during several periods.
REMARKS.—Records for low stages fair and for high stages poor. At low stages flow affected by pumping; capacity of pumps 40 second-feet, but actual amount of water diverted not known. Low-water flow partly regulated by small reservoir above gage.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June	July	Sept.
1	3.2	3.2	5.1	5.8		8.9	10	7.9		0.1	0
2	3.2	2.5	5.1	5.8		8.9	11	5.8		.1	0
3	3.8	2.5	3.8	5.1		7.9	11	5.8		.1	0
4	3.8	3.2	3.8	3.2		7.9	11	4.5		.1	0
5	3.8	3.2	3.8	3.8	*7.4	7.9	11	4.5		.1	
6	3.8	3.2	4.5	4.5		7.9	11	4.5	*5.0	.1	
7	3.8	3.8	5.1	5.1		8.9	11	*728		.1	
8	1.7	5.1	5.8	5.8		7.9	13			.1	*150
9	1.5	5.8	6.8	*5.1	6.8	7.9	11			0	
10	1.5	5.8	7.9	*5.8	6.8	7.9	11			0	
11	1.5	7.9	10	*6.8	6.8	10	10			0	
12	1.2	7.9	10	*5.8	6.8	126	11	*34		0	
13	1.5	*7.2	8.9	*5.8	8.9	62	11			0	58
14	1.7	*6.5	7.9	*5.8	8.9	23	10			0	18
15	1.7	*5.8	7.9	*5.8	8.9	16	10		*2.0	0	7.9
16	1.2	*5.1	6.8	*5.8	8.9	13	10			0	7.9
17	.7	*4.4	7.9	*5.8	8.9	11	8.9			0	11
18	.6	3.8	7.9	*7.9	8.9	11	10			0	3.2
19	.7	5.8	7.9	*7.9	8.9	11	8.9				1.7
20	1.0	6.8	7.9	*8.9	8.9	379	8.9	*10	.2		1.7
21	1.7	6.8	7.9	*8.9	8.9	409	8.9		.2		1.2
22	1.5	8.9	7.9	*7.9	8.9	39	8.9		.2	*3.0	1.0
23	1.0	8.9	7.9	*7.9	8.9	19	8.9		.4		.8
24	1.2	8.9	7.9	*7.9	8.9	13	21	*215	.5		.4
25	1.7	7.9	7.9		8.9	11	10		.3		.3
26	1.5	5.8	7.9		8.9	10	8.9		.2	0	.1
27	1.7	5.8	7.9	*7.4	8.9	8.9	7.9		.2	0	0
28	2.0	5.8	8.9		8.9	8.9	8.9		.1	0	0
29	2.0	6.8	7.9		-------	10	27	*10	.1	0	0
30	1.7	5.8	6.8		-------	10	65		.1	0	0
31	2.2	-------	5.8		-------	8.9	-------		-------	0	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	3.8	0.6	1.94	119
November	8.9	2.5	5.70	339
December	10	3.8	7.08	435
January	----------	----------	6.47	398
February	----------	----------	8.17	454
March	409	7.9	41.7	2,560
April	65	7.9	12.8	762
May	728	----------	59.1	3,630
June	----------	.1	2.35	140
July	----------	0	.70	43
September	----------	0	43.8	2,610
The year	728	0	15.9	11,500

* Estimated.
NOTE.—No flow during August.

Digitized by Google

NORTH CONCHO RIVER AT SAN ANGELO, TEX.

LOCATION.—Water-stage recorder at concrete viaduct in San Angelo, Tom Green County, 1 mile above confluence with South Concho River.

DRAINAGE AREA.—1,800 square miles.

RECORDS AVAILABLE.—October, 1915, to September, 1929.

EXTREMES.—Maximum discharge during year, 4,300 second-feet May 9 (gage height, 5.05 feet); no flow during several periods.

1915–1929: Maximum discharge not determined (gage height, when backwater from Concho River probably existed, 19.3 feet Apr. 26, 1922); no flow during several periods.

REMARKS.—No record Oct. 1 to Feb. 11. Records fair for rest of year. About 600 acres has been declared irrigated above station.

Daily and monthly discharge, in second-feet, 1929

Day	Feb.	Mar.	Apr.	May	June	July	Sept.
1		9.1	10	41	12	0	0
2		6.2	10	15	11	0	0
3		6.0	10	6.2	14	0	0
4		6.2	10	5.5	6.2	0	0
5		6.2	9.8	4.0	5.0	0	
6		6.2	9.1	3.6	3.8	0	
7		5.8	13	3.4	3.2	.1	
8		5.5	18	13	3.8	0	190
9		5.0	10	1,200	2.3	0	
10		5.0	9.8	87	2.0	0	
11		5.5	7.2	36	2.0	0	
12	6.0	16	6.5	26	1.5	0	14
13	5.8	162	6.5	30	1.0	0	95
14	5.8	52	6.2	16	1.0	0	38
15	6.5	32	6.2	9.1	.8	0	17
16	6.0	24	6.0	6.2	.6	0	7.2
17	5.5	18	6.0	6.2	.6	0	4.0
18	5.8	18	5.8	8.4	.6	0	2.6
19	5.5	16	5.2	6.5	.6	5.4	3.6
20	6.5	35	5.2	5.0	.9	13	2.4
21	7.8	732	5.0	4.2	.8	2.6	1.5
22	7.2	120	4.5	6.0	.6	1.5	1.2
23	6.5	52	4.2	34	.4	1.1	.9
24	6.2		30	747	0	.8	.8
25	6.5		35	40	0	.7	.8
26	6.5	26	10	18	0	.5	.8
27	10		6.2	17	0	.3	.8
28	9.8		5.0	17	0	.1	.7
29			99	11	0	0	.6
30		14	88	7.8	0	0	.8
31		12		7.8		0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
February 12-28	10	5.5	6.70	226
March	732	5.0	49.2	3,080
April	99	4.2	15.2	904
May	1,200	3.4	78.6	4,830
June	14	0	2.49	148
July	13	0	.84	52
September		0	50.8	3,020
The period				12,200

NOTE.—No flow during August.

Digitized by Google

PECAN BAYOU AT BROWNWOOD, TEX.

LOCATION.—Water-stage recorder at Fort Worth & Rio Grande Railway bridge 1 mile north of Brownwood, Brown County. Prior to July 11 gage-height record obtained from staff gage at city pumping plant one-fourth mile downstream. Present gage datum is one-tenth foot higher than that of old gage. Zero of gage, 1,319.26 feet above mean sea level.

DRAINAGE AREA.—1,610 square miles.

RECORDS AVAILABLE.—May, 1917, to June, 1918, and October, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year not determined; no flow during several periods.

1917–18, 1923–1929: Maximum discharge, 22,600 second-feet May 20, 1928 (gage height, 14.30 feet); no flow during several periods.

REMARKS.—Records poor, Oct. 1 to July 10; good, July 11 to Sept. 30. 590 acres has been declared irrigated above station. Flow regulated during normal stages by storage reservoirs and pumping plants above station.

Daily discharge, in second-feet, 1928–29

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Sept.
1	0				21				0
2	67					0			0
3	21		0						0
4	12								0
5	7.6								0
6	5.2			0					0
7	2.8						0		0
8	1.2								387
9	.2								58
10	0								9.2
11	0								4.4
12	0				*505				81
13	0				515				41
14	0				127				21
15	*345				74				14
16		*371			38				6.8
17		*2,460							462
18									155
19									35
20									14
21	10								8.4
22								0	4.4
23			*625						2.8
24			109						1.2
25									0
26				*866				*0	0
27				175					0
28				57					0
29									0
30									0
31									

* Estimated.

NOTE.—No flow during October, July, and August. No records during other periods of which no daily discharge is given. Total run-off for September, 2,590 acre-feet.

Digitized by Google

SAN SABA RIVER AT MENARD, TEX.

LOCATION.—Staff gage 1,000 feet above highway bridge in Menard, Menard County, and half a mile below mouth of Las Moras Creek.

DRAINAGE AREA.—1,150 square miles.

RECORDS AVAILABLE.—September, 1915, to September, 1929.

EXTREMES.—Maximum discharge during year, about 1,090 second-feet Sept. 6 (gage height, 5.54 feet); no flow Aug. 21.

1915–1929: Maximum discharge, about 8,610 second-feet Sept. 16, 1915 (gage height, 13.6 feet); no flow during several periods in 1918 and 1928–29.

On July 5 and 6, 1899, the river reached a stage of 25.4 feet, present datum.

REMARKS.—Records fair. Flow at low stages during irrigation season regulated by diversions to Noyes Canal, which diverts 4 miles above Menard. About 4,300 acres above gage and about 7,700 acres below gage have been declared irrigated.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	48	16	16	29	18	33	12	5.8	25	3.4	3.2	3.3
2	44	16	36	29	18	33	12	5.1	24	4.0	3.2	3.3
3	41	16	42	27	18	33	12	5.1	24	25	3.2	3.3
4	40	16	42	27	18	32	12	4.9	23	7.2	2.8	3.3
5	40	16	36	27	18	32	12	4.9	23	5.6	3.0	3.4
6	40	15	33	26	27	31	12	5.1	23	4.5	2.2	482
7	38	16	34	24	32	29	12	5.1	21	3.8		167
8	36	16	36	28	33	29	12	5.1	9.8	3.4		21
9	36	23	34	32	33	34	12	13	8.7	2.8		20
10	36	34	35	32	32	32	11	18	7.2	2.8		16
11	36	34	35	30	32	34	9.8	8.7	6.1	3.0	1.5	7.2
12	36	34	35	29	32	34	9.8	7.8	5.1	2.8		7.5
13	34	33	36	29	32	34	9.4	10	4.7	2.8		7.0
14	34	15	36	31	32	32	11	27	4.7	2.7		6.1
15	32	11	32	30	32	24	11	225	4.5	2.7	3.2	5.4
16	30	11	32	29	32	21	10	58	4.5	2.7		7.5
17	43	11	32	30	32	10	8.7	36	4.0	2.6	1.5	7.8
18	35	11	30	29	32	8.7	8.1	27	3.2	2.4		7.8
19	18	11	31	29	32	8.7	8.7	25	3.2	2.4		7.8
20	17	10	29	29	33	139	9.8	25	2.8	2.2	1.9	7.8
21	16	10	29	29	34	49	8.7	23	2.8	2.2	0	8.1
22	16	11	29	29	31	19	8.1	8.1	2.6	7.8	2.6	8.1
23	16	10	29	29	31	13	8.1	7.5	2.6	20	3.0	7.5
24	15	10	29	29	31	13	8.1	11	2.6	20	3.0	7.0
25	15	11	28	28	30	13	7.5	11	2.6	19	3.0	7.0
26	14	11	28	27	34	13	7.0	16	2.4	19	3.0	7.0
27	16	16	28	24	34	13	6.4	11	2.4	20	3.3	7.5
28	16	16	30	19	33	16	6.4	13	2.4	20	3.3	7.8
29	16	16	30	20	-------	16	7.8	20	3.3	15	3.3	7.8
30	21	16	27	19	-------	16	7.8	28	3.6	3.3	3.3	7.8
31	21	-------	27	17	-------	15	-------	26	-------	3.0	3.3	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	48	14	28.9	1,780
November	34	10	16.4	976
December	42	16	31.8	1,960
January	32	17	27.3	1,680
February	34	18	29.5	1,640
March	139	8.7	27.7	1,700
April	12	6.4	9.71	578
May	225	4.9	22.5	1,380
June	25	2.4	8.63	514
July	25	2.2	7.68	472
August	----------	0	2.32	143
September	482	3.3	29.0	1,730
The year	482	0	20.1	14,600

Digitized by Google

SAN SABA RIVER NEAR SAN SABA, TEX.

LOCATION.—Staff gage 200 feet above Beveridge highway bridge and 2 miles northwest of San Saba, San Saba County.

DRAINAGE AREA.—3,040 square miles.

RECORDS AVAILABLE.—December, 1904, to December, 1906, and September, 1915, to September, 1929.

EXTREMES.—Maximum discharge during year, 7,460 second-feet May 30 (gage height, 21.7 feet); minimum, 18 second-feet July 18 and 19 (gage height, 1.26 feet).

1904–1906, 1915–1929: Maximum discharge not determined (gage height, from floodmarks, about 37.0 feet Apr. 26 and 27, 1922); no flow Aug. 9 and 10, 1918.

REMARKS.—Records fair. Considerable water is diverted above gage. About 9,300 acres above and 2,700 acres below station have been declared irrigated. Flood waters from Brady Creek at Brady are partly stored for municipal uses; capacity of reservoir not known but probably small. Discharge estimated Aug. 25.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	293	100	78	60	54	72	83	45	846	32	31	35
2	220	85	80	58	54	64	78	40	424	33	31	35
3	178	83	80	58	54	62	80	28	314	33	30	35
4	148	78	76	64	53	70	75	28	358	45	36	34
5	132	78	73	67	52	72	67	28	358	49	32	32
6	118	82	72	67	61	70	61	31	240	54	27	1,600
7	111	82	83	66	55	70	58	28	188	58	28	1,090
8	107	76	85	64	55	66	61	28	148	53	29	4,690
9	100	75	87	68	52	61	70	117	118	44	29	1,190
10	96	75	88	76	52	60	75	53	120	32	32	336
11	90	72	90	76	60	64	148	35	111	32	33	209
12	90	68	98	72	66	76	117	41	98	32	33	158
13	88	68	93	72	70	87	94	37	87	29	32	122
14	87	68	83	72	68	73	105	38	76	32	33	87
15	83	73	83	70	64	66	88	37	70	28	35	82
16	88	82	82	68	64	61	90	44	66	26	33	75
17	83	85	85	68	64	58	75	42	64	27	34	70
18	78	83	88	70	61	60	66	188	58	19	35	70
19	76	70	87	68	61	68	66	111	52	18	35	64
20	76	64	78	67	61	120	60	80	45	34	34	61
21	76	55	76	67	72	924	54	64	37	38	32	58
22	75	62	73	67	70	866	52	61	32	35	35	54
23	70	66	73	67	72	446	49	55	42	33	35	50
24	64	66	73	64	73	262	45	52	42	31	35	53
25	61	66	73	62	75	178	43	1,330	35	32	35	53
26	61	64	70	66	73	146	38	499	29	35	35	49
27	61	73	68	66	73	115	35	358	28	37	35	45
28	67	76	68	64	73	105	37	402	28	36	35	43
29	67	78	67	64	------	98	37	2,810	32	35	35	43
30	78	78	64	60	------	94	57	3,610	37	32	35	42
31	87	------	61	58	------	92	------	4,190	------	30	35	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	293	61	100	6,150
November	100	55	74.4	4,430
December	98	61	78.5	4,830
January	76	58	66.3	4,080
February	75	52	62.9	3,490
March	924	58	152	9,350
April	148	35	68.8	4,090
May	4,190	28	468	28,800
June	846	28	139	8,270
July	58	18	35.0	2,150
August	36	27	33.0	2,030
September	4,690	32	352	20,900
The year	4,690	18	136	98,600

Digitized by Google

NOYES CANAL AT MENARD, TEX.

LOCATION.—Staff gage 1,000 feet above highway bridge in Menard, Menard County, and 4 miles below head gates.

RECORDS AVAILABLE.—March, 1924, to September, 1929.

EXTREMES.—Maximum discharge during year, 30 second-feet Mar. 20 (gage height, 1.58 feet); no flow during several periods.

1924–1929: Maximum discharge, 55 second-feet May 12 and June 13, 1927; no flow during several periods.

REMARKS.—Records fair. Canal diverts from San Saba River 4 miles above Menard. Water used for irrigation near Menard; 10 acres irrigated above station. Flow regulated at head gates.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	20	22	7.6	12	0	21	21	0	20	16	16
2	0	20	0	7.6	12	0	21	21	0	20	16	16
3	0	20	0	7.6	12	0	21	20	0	22	16	16
4	0	20	0	7.6	12	0	21	21	0	22	16	16
5	0	20	0	7.6	12	0	20	21	0	20	16	16
6	0	20	6.5	7.5	4.4	0	20	20	0	20	15	21
7	0	20	6.5	5.8	0	0	21	20	3.6	20	14	21
8	2.0	20	6.5	6.1	0	0	21	21	17	20	15	18
9	2.4	8.0	6.5	5.4	0	0	21	22	15	18	15	16
10	3.0	0	6.5	5.2	0	0	20	24	17	20	15	16
11	3.0	0	6.5	5.2	0	0	20	21	17	20	16	16
12	3.0	0	6.5	5.6	0	0	21	20	17	20	16	16
13	3.0	0	6.3	6.5	0	0	21	21	17	20	15	16
14	3.0	20	6.5	7.2	0	4.6	21	0	17	20	15	16
15	3.0		7.8	5.4	0	12	20	0	20	18	16	17
16	2.0	22	7.8	4.9	0	20	20	0	20	18	16	21
17	0	22	11	4.3	0	24	20	0	20	18	15	24
18	0	24	12	4.3	0	25	20	0	20	20	15	23
19	15	22	12	5.8	0	24	21	0	17	20	15	22
20	20	22	12	5.8	0	30	21	0	17	17	18	22
21	21	24	12	5.4	0	28	21	8.6	17	17	18	24
22	20	24	13	4.2	0	28	21	20	17	0	21	22
23	20	24	13	4.0	0	26	21	20	16	0	16	17
24	18	25	12	4.3	0	24	21	20	16	0	16	16
25	18	24	12	4.3	0	22	21	22	16	0	17	16
26	18	24	11	4.0	0	22	21	22	17	0	18	16
27	20	24	7.6	7.6	0	22	22	22	17	0	16	16
28	20	24	7.4	13	0	22	22	11	17	9.8	16	16
29	20	24	7.6	13	------	20	22	0	17	16	16	16
30	20	24	7.6	13	------	20	21	0	20	16	16	16
31	20	------	7.6	12	------	20	------	0	------	16	16	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October (22 days)	21	2.0	12.5	544
November (26 days)	----------	8.0	21.6	1,110
December (27 days)	22	6.3	9.40	503
January	13	4.0	6.71	413
February (6 days)	12	4.4	10.7	128
March (18 days)	30	4.6	21.9	781
April	22	20	20.8	1,240
May (21 days)	24	8.6	19.9	830
June (24 days)	20	3.6	16.9	803
July (25 days)	22	9.8	18.7	928
August	21	14	16.0	984
September	24	16	18.0	1,070
The year	----------	----------	----------	9,330

Digitized by Google

NORTH LLANO RIVER NEAR JUNCTION, TEX.

LOCATION.—Water-stage recorder 500 feet above remains of old Wilson Dam and 3 miles northwest of Junction, Kimble County.

DRAINAGE AREA.—914 square miles.

RECORDS AVAILABLE.—September, 1915, to September, 1929.

EXTREMES.—Maximum discharge during year, 1,530 second-feet May 24 (gage height, 4.12 feet); minimum, 0.1 second-foot Sept. 6 (gage height, 0.75 foot). 1915–1929: Maximum discharge, about 43,100 second-feet Apr. 24, 1923 (gage height, 23 feet); no flow during several periods.

REMARKS.—Records for low stages good and for high stages poor. Discharge estimated Sept. 8–10. About 1,200 acres has been declared irrigated by diversions above station. During low stages, diversions materially reduce flow at station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	36	18	22	17	15	13	14	9.2	17	0.3	0.5	0.3
2	32	17	23	16	15	12	14	8.2	15	.4	.5	.3
3	31	18	25	16	15	11	14	7.1	13	3.7	.5	.2
4	29	18	23	15	13	12	14	7.1	12	1.9	.5	.2
5	27	18	22	14	14	12	14	7.6	10	1.1	.5	.1
6	25	18	22	14	13	11	13	7.1	8.7	.9	.5	10
7	23	18	22	14	13	12	14	7.1	8.2	.9	.5	121
8	23	18	22	14	13	13	14	6.6	7.6	.9	.4	15
9	20	17	20	13	13	12	12	7.1	7.1	.9	.4	7.6
10	20	20	18	12	13	13	10	6.6	6.6	.9	.4	3.5
11	18	20	18	14	12	13	9.2	6.1	5.6	.9	.4	1.4
12	17	18	18	13	13	14	8.7	5.6	4.5	1.0	.4	1.3
13	17	17	18	12	13	14	8.7	5.0	4.0	.9	.4	1.3
14	17	17	18	12	13	14	10	4.5	3.7	.8	.7	1.3
15	16	17	17	12	13	14	8.7	4.0	3.2	.8	.5	1.2
16	16	17	18	14	12	13	8.7	3.7	2.7	.7	.4	1.2
17	15	17	20	14	12	13	8.7	3.7	2.2	.7	.4	1.4
18	16	16	20	14	13	13	8.2	4.0	1.9	.7	.4	1.3
19	15	16	20	14	12	12	7.6	4.0	1.9	.9	.4	1.4
20	15	16	20	14	13	12	85	3.5	1.7	3.5	.4	1.4
21	16	16	20	16	12	13	48	3.2	1.2	1.2	.4	1.9
22	17	16	20	17	13	14	27	3.0	.5	.9	.4	1.9
23	20	17	18	15	12	13	18	12	.4	.9	.4	1.9
24	18	17	16	15	12	13	16	314	.3	.7	.4	1.7
25	17	18	18	16	13	13	15	148	.8	.7	.3	1.9
26	17	18	18	16	12	13	14	102	.9	.7	.3	1.9
27	18	20	18	16	12	13	11	36	.5	.7	.3	1.9
28	17	20	18	16	12	14	10	27	.4	.6	.3	1.9
29	18	18	18	16	------	14	10	23	1.0	.5	.3	1.9
30	18	20	18	16	------	14	10	25	1.0	.5	.3	1.9
31	20	------	18	15	------	14	------	31	------	.5	.3	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	36	15	20.1	1,240
November	20	16	17.7	1,050
December	25	16	19.5	1,200
January	17	12	14.6	898
February	15	12	12.9	716
March	14	11	12.9	793
April	85	7.6	15.8	940
May	314	3.0	27.2	1,670
June	17	.3	4.79	285
July	3.7	.3	.99	61
August	.7	.3	.41	25
September	121	.1	6.34	377
The year	314	.1	12.8	9,260

Digitized by Google

LLANO RIVER NEAR JUNCTION, TEX.

LOCATION.—Water-stage recorder 100 feet north of Kerrville-Junction road, 3 miles below confluence of North Llano and South Llano Rivers, and 3½ miles east of Junction, Kimble County.

DRAINAGE AREA.—1,760 square miles.

RECORDS AVAILABLE.—September, 1915, to September, 1929.

EXTREMES.—Maximum discharge during year, 2,100 second-feet May 28 (gage height, 3.77 feet); minimum, 33 second-feet Aug. 12, 18, 19, 22, and 25.

1915–1929: Maximum discharge, about 98,800 second-feet Sept. 16, 1915 (gage height, 26.3 feet); minimum, 13 second-feet Aug. 23–28, 1918 (gage height, 1.32 feet).

REMARKS.—Low-stage records good, high-stage records fair. About 2,500 acres above and 1,300 acres below station have been declared irrigated. Diversions slightly reduce flow at station during low stages. Slight regulation by water-power plant on South Llano River.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	87	69	77	77	72	63	63	52		55	44	37
2	84	69	74	77	69	66	63	52		55	42	37
3	84	69	74	77	69	63	63	52		55	42	37
4	80	74	72	77	66	60	63	52		55	42	37
5	77	74	72	77	69	63	63	52		55	42	37
6	74	74	74	77	69	60	60	52		52	39	116
7	74	74	77	77	66	60	63	52		52	37	330
8	72	72	77	77	66	63	63	48		52	37	63
9	72	74	77	77	66	63	63	50		50	35	52
10	69	77	77	77	66	63	60	48	*55	48	35	50
11	72	77	77	77	66	66	63	46		46	35	48
12	69	77	77	77	66	69	66	44		46	33	48
13	69	77	77	77	63	69	66	44		46	35	48
14	69	77	74	80	63	69	69	44		44	39	48
15	69	77	74	77	63	69	69	44		44	39	44
16	69	74	77	74	63	66	69	44		44	37	42
17	69	74	80	74	60	66	69	46		44	37	44
18	72	72	80	74	60	66	69	46	*50	44	33	44
19	72	74	80	74	63	66	66	46	48	51	33	46
20	72	72	80	74	63	66	107	46	48	62	35	44
21	72	72	80	74	63	69	105	48	48	46	35	44
22	69	72	77	72	63	72	84	48	48	44	33	44
23	69	74	80	74	63	69	74	53	50	44	35	44
24	69	72	77	74	63	69	72	364	50	44	35	46
25	69	74	77	72	63	69	66	156	50	48	33	44
26	69	74	77	72	66	66	66	216	50	48	35	44
27	69	74	80	72	66	66	63	112	48	48	35	46
28	69	77	80	72	66	66	60	271	48	48	35	46
29	69	77	80	72	------	66	58	283	50	50	37	46
30	69	77	77	72	------	66	55	*75	52	48	37	46
31	69	------	77	72	------	66	------		------	46	37	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	87	69	72.2	4,440
November	77	69	74.0	4,400
December	80	72	77.1	4,740
January	80	72	75.0	4,610
February	72	60	65.0	3,610
March	72	60	65.8	4,050
April	107	55	68.0	4,050
May	364	44	85.3	5,250
June	------	48	52.5	3,120
July	62	44	48.8	3,000
August	44	33	36.7	2,260
September	330	37	56.7	3,370
The year	364	33	64.8	46,900

* Estimated.

Digitized by Google

LLANO RIVER NEAR CASTELL, TEX.

LOCATION.—Staff gage 4 miles above mouth of Hickory Creek and 6 miles east of Castell, Llano County.
DRAINAGE AREA.—3,510 square miles.
RECORDS AVAILABLE.—November, 1923, to September, 1929.
EXTREMES.—Maximum discharge during year, 27,300 second-feet Sept. 7 (gage height, 12.90 feet); minimum, 16 second-feet Aug. 17, Sept. 4 and 5 (gage height, 0.59 foot).
1923–1929: Maximum discharge, about 59,500 second feet May 30, 1925 (gage height, 16.8 feet); minimum, that of Aug. 17, Sept. 4 and 5, 1929.
REMARKS.—Records good. Several small diversions above station; amount not known. Diversions slightly reduce flow at station during low stages.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	136	93	104	82	79	79	79	62	570	35	47	18
2	124	88	104	82	88	78	76	59	465	33	42	18
3	104	82	98	82	88	78	76	56	380	47	40	17
4	98	82	96	88	82	76	76	52	222	78	33	16
5	93	81	93	88	82	70	76	50	197	88	27	16
6	88	82	98	82	82	69	76	46	190	68	23	44
7	78	68	104	82	82	70	74	45	150	62	22	10,500
8	75	88	98	88	82	69	74	45	136	54	21	1,400
9	75	88	98	93	82	69	80	63	124	47	19	404
10	73	82	98	93	81	71	78	71	110	42	18	190
11	71	82	98	86	79	88	73	74	93	38	18	136
12	69	86	98	88	82	98	73	68	93	36	18	104
13	69	82	98	86	81	98	104	61	88	34	17	79
14	68	82	98	88	81	93	124	57	82	34	16	74
15	67	86	98	88	81	82	93	53	75	33	17	72
16	79	88	104	88	81	79	93	79	71	30	16	61
17	75	88	96	82	81	74	88	58	64	30	17	58
18	72	88	98	88	82	74	80	79	60	27	54	51
19	72	82	93	82	81	75	117	70	56	26	40	46
20	71	78	93	82	81	82	82	75	53	40	29	38
21	70	78	88	82	81	104	82	62	51	301	23	35
22	69	78	86	82	82	143	72	56	49	117	21	34
23	67	78	88	82	82	162	93	52	45	86	20	33
24	66	82	88	82	81	130	110	159	38	70	18	32
25	68	82	88	82	79	104	98	250	36	67	20	32
26	68	93	88	82	78	93	82	490	34	60	20	31
27	68	96	82	82	76	93	78	330	34	51	19	30
28	68	104	82	80	76	86	74	870	32	71	20	30
29	68	96	82	78	------	88	74	2,540	28	61	20	29
30	80	104	82	80	------	88	66	7,390	35	62	19	28
31	88	------	88	80	------	82	------	1,370	------	53	19	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	136	67	78.7	4,840
November	104	78	86.5	5,150
December	104	82	94.0	5,780
January	93	78	84.3	5,180
February	88	76	81.2	4,510
March	162	69	88.6	5,450
April	124	66	84.0	5,000
May	7,390	45	477	29,300
June	570	28	122	7,260
July	301	26	60.7	3,730
August	54	16	24.3	1,490
September	10,800	16	465	27,700
The year	10,800	16	146	105,000

Digitized by Google

PEDERNALES RIVER AT STONEWALL, TEX.

LOCATION.—Staff gage at Stonewall, Gillespie County, 2 miles below mouth of South Grape Creek.
DRAINAGE AREA.—647 square miles.
RECORDS AVAILABLE.—July, 1924, to September, 1929.
EXTREMES.—Maximum discharge during year, about 38,100 second-feet May 28, determined by slope-area method (gage height, 14.25 feet); minimum, 3.1 second-feet Oct. 20, 21, 25, and 26 (gage height, 0.41 foot).
1924–1929: Maximum discharge, that of May 28, 1929; minimum, 1.8 second-feet July 30 and 31, 1925 (gage height, 0.33 foot).
River reached stage of about 24.0 feet in 1900.
REMARKS.—Records good. No diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.5	3.7	10	4.3	5.2	6.0	6.0	6.8	251	10	7.5	3.5
2	4.1	3.7	7.5	4.3	6.0	6.0	5.2	6.0	165	9.0	6.0	3.5
3	4.1	3.7	6.8	4.3	6.0	5.2	5.2	4.5	123	403	5.2	3.5
4	3.7	3.7	6.8	187	6.0	6.0	5.2	4.5	97	67	4.5	3.5
5	3.7	4.5	6.8	410	5.2	6.0	5.2	4.5	85	2,270	4.5	3.3
6	3.7	6.0	7.5	28	5.2	5.3	5.2	4.3	72	785	4.5	3.5
7	3.7	4.1	8.2	16	6.0	5.2	5.2	4.3	62	49	4.3	3.7
8	3.5	4.3	7.5	11	6.8	5.2	50	4.1	55	34	4.1	3.5
9	3.5	4.3	7.5	10	6.0	4.5	72	4.5	46	25	4.1	3.5
10	3.3	4.3	8.2	9.8	5.2	4.5	21	32	42	21	4.1	3.3
11	3.3	4.1	9.0	8.2	5.2	6.0	11	10	37	18	4.1	3.3
12	3.3	4.1	9.0	7.5	5.2	10	9.8	30	34	18	4.1	3.5
13	3.3	4.3	9.0	6.8	5.2	27	450	39	30	16	4.1	3.9
14	3.3	4.3	7.5	6.0	5.2	24	388	9.8	27	15	4.1	3.9
15	3.3	4.5	7.5	6.0	5.2	13	37	6.8	24	13	3.9	3.5
16	3.3	4.5	60	6.0	5.2	9.8	16	5.2	21	11	3.7	5.2
17	3.5	4.5	24	6.0	5.2	9.8	11	4.5	20	11	3.7	4.3
18	3.3	4.5	11	6.0	5.2	8.2	9.8	42	18	9.8	3.9	3.9
19	3.3	4.3	7.5	5.2	6.0	8.2	9.8	9.8	17	9.8	3.9	3.5
20	3.1	4.5	6.0	5.2	6.8	9.0	36	6.0	16	93	3.7	3.5
21	3.3	4.5	5.2	4.5	6.8	9.8	255	4.3	13	18	3.7	3.5
22	3.5	4.5	5.2	6.0	6.0	8.2	51	3.9	11	11	3.7	3.5
23	3.3	4.5	5.2	6.0	6.0	7.5	15	3.6	10	9.8	3.7	3.3
24	3.3	4.5	5.2	5.2	6.0	6.8	10	1,520	9.8	8.2	3.7	3.3
25	3.3	4.5	5.2	5.2	6.0	6.8	10	72	9.8	126	3.7	3.3
26	3.3	4.5	4.5	5.2	6.0	6.8	8.2	37	9.8	62	3.7	3.3
27	3.3	6.0	4.5	5.2	6.8	6.8	7.5	20	8.2	28	3.7	3.5
28	3.3	6.0	4.5	5.2	6.0	6.8	7.5	21,700	8.2	27	3.7	3.5
29	3.5	7.5	4.5	5.2	------	6.8	7.5	2,760	22	15	3.7	3.5
30	3.5	9.0	4.5	5.2	------	6.8	7.5	2,820	20	10	3.7	3.3
31	3.7	------	4.5	5.2	------	6.0	------	625	------	9.0	3.7	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	4.5	3.1	3.49	215
November	9	3.7	4.71	280
December	60	4.5	9.04	556
January	410	4.3	26.0	1,600
February	6.8	5.2	5.77	320
March	27	4.5	8.32	512
April	450	5.2	51.3	3,050
May	21,700	3.6	961	59,100
June	251	8.2	45.5	2,710
July	2,270	8.2	136	8,360
August	7.5	3.7	4.15	255
September	5.2	3.3	3.58	213
The year	21,700	3.1	107	77,200

Digitized by Google

PEDERNALES RIVER NEAR SPICEWOOD, TEX.

LOCATION.—Staff gage 2½ miles below mouth of Fall Creek and 8 miles southeast of Spicewood, Burnet County.
DRAINAGE AREA.—1,290 square miles.
RECORDS AVAILABLE.—November, 1923, to September, 1929.
EXTREMES.—Maximum discharge during year, about 155,000 second-feet May 28, determined by slope-area method (gage height, 40.4 feet); minimum, 1.1 second-feet Sept. 3, 4, 5, and 24.
1923–1929: Maximum discharge, that of May 28, 1929; no flow during several periods.
REMARKS.—Records fair. No diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	37	4.5	15	15	12	12	12	14	1,080	27	34	1.3
2	30	4.5	15	13	15	12	11	12	776	30	28	1.3
3	22	4.0	15	13	14	12	10	11	586	671	22	1.1
4	18	3.5	14	15	14	12	9.1	8.2	485	1,110	18	1.1
5	14	3.5	14	16	14	11	8.6	7.8	392	310	15	1.1
6	12	6.0	21	138	14	10	7.8	6.8	329	2,230	13	1.3
7	9.6	7.8	25	143	15	10	7.3	6.0	273	583	11	1.4
8	8.2	9.1	24	86	16	10	16	5.2	238	273	10	1.5
9	7.3	9.1	24	62	15	10	16	6.4	208	183	9.0	1.4
10	6.4	8.6	27	46	15	10	34	6.4	181	140	8.5	1.3
11	5.5	9.6	30	34	15	11	80	5.5	161	118	7.5	1.3
12	5.0	13	31	29	15	14	71	8.6	140	107	6.6	1.3
13	4.5	15	31	25	15	18	54	280	128	96	6.0	2.5
14	4.0	15	30	23	15	21	60	177	116	89	6.0	2.9
15	3.5	14	32	21	14	39	441	124	109	81	5.2	2.3
16	4.0	14	37	19	14	60	177	82	98	72	5.2	2.3
17	5.0	14	39	19	14	50	94	76	87	64	4.9	2.5
18	6.4	14	35	18	14	43	65	70	74	53	3.8	2.1
19	25	14	30	18	14	34	46	59	70	49	3.5	1.9
20	16	14	64	16	14	29	30	84	62	81	3.1	1.7
21	11	14	44	16	13	26	28	64	57	93	2.9	1.5
22	7.8	14	34	16	12	24	23	44	51	53	2.7	1.4
23	6.4	14	30	15	12	24	81	30	47	64	2.7	1.3
24	5.5	14	24	15	12	24	112	3,730	42	51	2.3	1.1
25	5.0	14	22	15	13	24	64	1,080	37	39	2.3	1.3
26	4.5	14	19	14	14	22	44	298	28	552	2.3	1.5
27	4.5	15	18	14	14	22	33	177	25	294	2.3	1.5
28	4.5	15	17	14	14	18	25	80,000	25	151	1.9	1.7
29	4.2	15	16	13	------	15	20	22,500	27	83	1.7	1.9
30	4.0	15	15	12	------	14	17	5,800	28	70	1.5	1.9
31	4.0	------	15	12	------	13	------	3,470	------	46	1.4	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	37	3.5	9.83	604
November	15	3.5	11.4	678
December	64	14	26.0	1,600
January	143	12	29.8	1,830
February	16	12	14.0	778
March	60	10	21.1	1,300
April	441	7.3	56.6	3,370
May	80,000	5.2	3,810	234,000
June	1,080	25	199	11,800
July	2,230	27	254	15,600
August	34	1.4	7.88	485
September	2.9	1.1	1.62	96
The year	80,000	1.1	377	272,000

Digitized by Google

ONION CREEK NEAR DEL VALLE, TEX.

LOCATION.—Staff gage at Del Valle-Creedmoor highway crossing 2 miles below mouth of Williamson Creek and 2½ miles southwest of Del Valle, Travis County.

DRAINAGE AREA.—337 square miles.

RECORDS AVAILABLE.—May, 1924, to September, 1929.

EXTREMES.—Maximum discharge during year, 76,000 second-feet May 28 (gage height, 24.75 feet); no flow Oct. 1 to Nov. 10.

1924–1929: Maximum discharge, that of May 28, 1929; no flow during several periods.

REMARKS.—Monthly records fair. Record of daily discharge not sufficiently accurate for publication. No diversions above station.

Monthly discharge, in second-feet, 1928–29

Month	Maximum	Minimum	Mean	Run-off in acre-feet
November	1.5	0	0.61	36
December	2.3	.6	1.45	89
January	54	1.3	5.55	341
February	2.3	1.9	2.07	115
March	16	1.9	3.78	232
April	154	1.9	15.6	928
May	30,500	1.3	1,770	109,000
June	1,280	85	353	21,000
July	440	43	130	7,990
August	36	5.0	13.9	855
September	9.0	3.5	4.89	291
The year	30,500	0	194	141,000

NOTE.—No flow during October.

Digitized by Google

GUADALUPE RIVER BASIN

GUADALUPE RIVER NEAR COMFORT, TEX.

LOCATION.—Staff gage at low-water bridge and dam on State highway No. 27, 2.6 miles west of Comfort, Kendall County.

DRAINAGE AREA.—916 square miles.

RECORDS AVAILABLE.—December, 1917, to September, 1929.

EXTREMES.—Maximum discharge during year not determined (gage height, 16.95 feet May 28); minimum, 16 second-feet Aug. 29 (gage height, 1.80 feet).

1918–1929: Maximum discharge not determined (gage height from floodmarks, about 41 feet Aug. 21, 1919); minimum, about 0.40 second-foot Aug. 2, 1918 (gage height, 0.80 foot).

REMARKS.—Records fair. About 400 acres has been declared irrigated above station. Several pumping plants 8 miles upstream. Regulation during low water caused by operation of water-power plants.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	48	44	51	41	43	38	34	24	282	66	34	21
2	41	41	48	41	48	41	34	22	225	43	31	22
3	37	38	47	41	51	46	36	22	182	1,150	30	20
4	34	36	48	41	48	37	36	23	159	1,400	29	18
5	30	40	46	55	42	38	35	22	137	922	28	17
6	28	36	46	46	42	41	36	18	118	92	23	52
7	28	41	47	41	40	42	36	17	106	59	22	82
8	30	41	41	43	41	36	64	18	90	50	22	66
9	30	38	42	50	41	34	46	21	77	43	22	46
10	29	41	46	53	42	36	43	56	77	41	19	36
11	28	38	46	53	38	43	41	51	70	35	18	31
12	28	40	46	48	38	53	42	943	70	38	18	30
13	28	40	47	53	38	59	38	460	63	37	18	30
14	31	41	42	51	43	59	43	64	53	38	18	234
15	30	42	41	41	43	51	43	56	58	41	17	318
16	118	43	61	51	46	43	36	46	56	31	17	59
17	36	42	63	44	44	43	34	43	48	30	17	48
18	40	38	50	46	41	42	37	77	41	30	17	43
19	38	40	46	41	40	44	41	48	41	27	18	41
20	41	36	43	46	40	48	34	47	46	29	18	36
21	36	36	38	46	41	48	31	37	42	22	18	31
22	36	36	38	52	43	46	38	34	42	24	17	31
23	36	36	38	44	46	41	36	30	42	26	17	30
24	36	38	36	46	43	51	31	498	36	25	17	28
25	31	38	38	46	46	46	30	115	36	25	17	28
26	34	36	37	46	44	46	31	279	29	28	18	28
27	37	38	38	43	43	42	30	142	30	120	17	30
28	36	43	38	38	43	43	24	8,640	34	71	17	28
29	33	48	40	41	------	43	28		92	51	17	28
30	36	48	43	38	------	38	28	1,040	66	44	17	28
31	44	------	41	41	------	41	------	430	------	36	18	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	118	28	37.0	2,280
November	48	36	39.8	2,370
December	63	36	44.3	2,720
January	55	38	45.4	2,790
February	51	38	42.8	2,380
March	59	34	43.8	2,690
April	64	24	36.5	2,170
May	----------	17	708	43,500
June	282	29	81.6	4,860
July	1,400	22	151	9,280
August	34	17	20.2	1,240
September	318	17	51.3	3,050
The year	----------	17	110	79,300

Digitized by Google

GUADALUPE RIVER NEAR SPRING BRANCH, TEX.

LOCATION.—Water-stage recorder at New Braunfels-Blanco highway bridge 4 miles southeast of Spring Branch, Comal County.

DRAINAGE AREA.—1,430 square miles.

RECORDS AVAILABLE.—June, 1922, to September, 1929.

EXTREMES.—Maximum discharge during year, 18,600 second-feet May 29 (gage height, 19.82 feet); minimum, 23 second-feet Oct. 10 and 11.

1922–1929: Maximum discharge, about 19,800 second-feet Apr. 21, 1926 (gage height, 20.70 feet); minimum, about 4.7 second-feet Aug. 18, 1923 (gage height, about 1.74 feet).

REMARKS.—Records fair. About 400 acres has been declared irrigated above station. Slight regulation caused by operation of water-power plant upstream, during low water.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	47	36	*41	36	44	48	*58	40	1,190		100	30
2	45	33	*44	36	45	51		38	845	*365	88	30
3	43	35	*43	37	47	51	50	35	671		82	29
4	38	38	*40	40	45	51	45	35	566	600	75	30
5	36	38	38	57	50	51	41	32	468	<3,310	65	31
6	33	43	44	45	51	53	43	32	399		75	32
7	33	41	48	45	50	51	43	35	340	935	73	32
8	31	37	45	50	48	51	424	35	290	516	69	64
9	27	36	43	47	51	51	359	29	256	394	62	75
10	27	36	43	45	48	51	113	30	226	327	59	61
11	25	35	44	45	47	56	91	29	201	294	57	53
12	24	35	41	47	44	59	69	343	172	263	56	44
13	24	36	44	48	44	57	73	1,070	151	234	53	40
14	25	33	47	45	44	62	134	781	134	219	51	41
15	25	36	47	45	44	64	154	229	122	201	50	37
16	27	44	47	45	44	65	84	144	110	183	48	99
17	227	45	51	44	47	62	64	100	98	165	47	82
18	80	43	64	45	47	57	57	105	91	151	44	62
19	45	38	53	51	45	54	51	194	88	144	44	56
20	35	38	48	47	47	59	51	119	93		41	45
21	32	35	43	45	47	64	51	88	86	*120	38	40
22	33	33	41	47	47	61	54	75	82		40	37
23	31	36	40	47	47	64	50	67	76		37	36
24	30	32	37	47	43	62	47	614	71		33	33
25	29	32	35	47	45		53	749	65	96	35	31
26	29	33	35	47	47		50	315	62	96	33	31
27	29	36	35	45	45	*58	45	286	59	98	33	30
28	30	36	36	45	45		44	5,340	56	125	32	29
29	32	*35	36	45	-------		44	17,600	62	158	32	27
30	33	*37	33	44	-------		41	6,140	*59	122	31	27
31	33	-------	35	43	-------		-------	1,930	-------	108	30	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	227	24	39.9	2,450
November	45	32	36.7	2,180
December	64	33	42.6	2,620
January	57	36	45.2	2,780
February	51	43	46.4	2,580
March	65	48	56.8	3,490
April	424	41	84.7	5,040
May	17,600	29	1,180	72,600
June	1,190	56	240	14,300
July	----------	96	443	27,200
August	100	30	52.0	3,200
September	99	27	43.1	2,560
The year	17,600	24	195	141,000

* Estimated.

Digitized by Google

GUADALUPE RIVER ABOVE COMAL RIVER, AT NEW BRAUNFELS, TEX.

LOCATION.—Water-stage recorder 1.1 miles above Comal River and 1.3 miles northeast from center of New Braunfels, Comal County. Zero of gage, 586.56 feet above mean sea level.

DRAINAGE AREA.—1,670 square miles.

RECORDS AVAILABLE.—December, 1927, to September, 1929.

EXTREMES.—Maximum discharge during year, 19,700 second-feet May 30 (gage height, 15.10 feet); minimum, 25 second-feet Oct. 15.

1927–1929: Maximum discharge, that of May 30, 1929; minimum, 14 second-feet July 20, 1928 (gage height, 0.88 foot).

A stage of about 38 feet was reached in 1869 and December, 1913.

REMARKS.—Records good. Discharge estimated Sept. 27. About 400 acres has been declared irrigated above station. Slight regulation caused by operation of power plants upstream during low stages.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	46	32	45	49	58	50	54	65	2,440	155	194	61
2	47	32	46	47	56	49	50	56	1,710	164	180	59
3	46	31	45	49	58	50	49	52	1,350	180	170	58
4	44	26	49	361	58	54	50	50	1,070	843	161	58
5	40	38	49	370	59	50	49	47	850	912	150	54
6	37	70	52	150	59	50	49	46	760	8,290	145	54
7	36	63	55	117	58	49	49	43	656	2,610	138	54
8	32	56	52	93	61	49	74	41	583	1,180	126	52
9	32	50	52	90	60	49	655	39	512	784	122	54
10	31	46	67	90	58	44	424	38	470	624	116	66
11	30	43	68	84	58	59	221	49	431	545	107	105
12	28	40	61	80	58	109	176	56	387	503	102	93
13	27	38	63	77	55	75	168	429	355	455	96	90
14	26	40	60	75	56	68	171	906	330	423	93	90
15	25	40	59	78	56	64	242	534	301	400	86	78
16	29	40	60	77	55	61	229	229	278	374	82	92
17	27	39	78	75	52	63	186	173	268	349	82	100
18	51	39	72	74	54	65	153	158	242	324	84	148
19	135	43	67	72	55	68	132	136	231	301	82	112
20	80	40	80	68	56	67	118	150	218	295	80	93
21	55	39	68	68	55	81	107	141	206	273	75	84
22	43	37	64	67	46	90	102	105	190	252	74	75
23	35	37	59	65	52	84	96	96	183	242	74	71
24	29	37	56	67	52	77	92	141	177	226	72	68
25	28	36	55	67	54	74	86	668	170	222	74	64
26	28	39	52	63	54	74	77	870	161	214	72	68
27	28	39	51	61	54	70	71	402	152	202	68	65
28	28	39	50	60	54	65	72	6,740	145	198	67	58
29	27	40	50	59	.....	60	70	15,200	174	198	64	58
30	27	43	50	59	.....	60	68	13,700	170	236	61	56
31	27	.....	50	59	.....	58	.....	4,010	.....	214	61	.....

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	135	25	38.8	2,390
November	70	26	41.1	2,450
December	80	45	57.6	3,540
January	370	47	92.6	5,690
February	61	52	56.1	3,120
March	109	44	64.1	3,940
April	655	49	138	8,210
May	15,200	38	1,460	89,800
June	2,440	145	506	30,100
July	8,290	155	716	44,000
August	194	61	102	6,270
September	148	52	74.6	4,440
The year	15,200	25	282	204,000

Digitized by Google

GUADALUPE RIVER BELOW CUERO, TEX.

LOCATION.—Water-stage recorder three-fourths mile upstream from Heards Bridge on Arneckville road and 2¼ miles southeast of Cuero, De Witt County.

DRAINAGE AREA.—5,070 square miles.

RECORDS AVAILABLE.—August, 1916, to September, 1929. From December, 1902, to December, 1906, and August, 1915, to August, 1916, a station was maintained at Schleicher Bridge, 4 miles above this point. Discharge at two sites practically the same.

EXTREMES.—Maximum discharge during year, about 101,000 second-feet May 30 (gage height, 35.2 feet); minimum, 190 second-feet Sept. 11 (gage height, 0.92 foot).

1916–1929: Maximum discharge, that of May 30, 1929; minimum, about 80 second-feet Nov. 1, 1917 (gage height, 0.58 foot).

A stage of 37.6 feet was reached Nov. 4, 1913.

REMARKS.—Records fair. Flow is probably not materially affected by numerous small diversions above station. Flow partly regulated by operation of water-power plants upstream.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	504	444	488	545	569	545	569	593	50,000	2,220	900	677
2	476	405	454	449	510	504	557	599		2,540		647
3	400	476	557	569	504	482	510	605		1,640		623
4	476	422	504	1,460	504	533	510	527	21,700	1,730		617
5	438	749	454	6,220	515	498	515	551	11,400	7,630		551
6	388	3,500	617	3,580	527	444	521	545	4,420	11,600		623
7	449	4,700	527	3,500	527	527	488	498		5,630		587
8	388	2,580	533	1,920	539	488	1,080	471		5,620		605
9	444	1,100	551	728	498	493	6,800	488		7,180		858
10	438	641	780	766	504	460	10,100	498		6,210		593
11	432	545	1,520	593	527	449	12,400	482		3,420		454
12	383	521	2,120	521	498	510	13,100	545	2,100	2,580	825	356
13	405	515	1,980	605	527	728	3,940	1,060		2,200	858	617
14	361	527	922	521	493	2,730	3,690	2,200		2,050	747	533
15	454	557	623	557	510	4,320	6,240	2,280		1,900	786	629
16	394	510	858	545	515	1,580	5,660	3,100		1,900	754	677
17	410	498	1,490	539	432	647	2,790	2,650		1,900	754	858
18	416	521	1,130	545	563	575	1,560	6,050		1,520	689	990
19	498	545	792	515	510	476	1,240	7,280	1,560	1,450	714	1,410
20	405	482	1,600	541	482	515		8,160	1,490	1,490	740	728
21	449	545	1,820	567	476	1,650	890	3,880	1,410	1,410	702	653
22	482	498	1,130	593	521	9,230		1,100	1,380	1,750	702	641
23	460	460	683	530	488	12,100		922	1,300	1,600	702	702
24	410	488	605	587	515	9,840	545	792	1,270	1,380	714	551
25	405	533	504	575	482	2,350	665	3,050	1,240	1,490	671	708
26	471	563	557	539	527	1,100	708	8,250	1,240	2,200	721	581
27	400	482	545	533	504	922	635	9,990	1,200	2,200	721	587
28	394	488	533	569	533	740	659	11,400	1,160	1,750	671	563
29	488	466	444	569	-------	653	545	18,000	1,600	1,410	683	593
30	394	575	476	504	-------	617	623	50,000	1,580	1,270	665	557
31	427	-------	504	527	-------	605	-------		-------	1,130	635	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	504	361	430	26,400
November	4,700	405	845	50,300
December	2,120	444	848	52,100
January	6,220	449	1,010	62,100
February	569	432	511	28,400
March	12,100	444	1,850	114,000
April	13,100	488	2,670	159,000
May	----------	471	6,340	390,000
June	----------	1,160	7,640	455,000
July	11,600	1,130	2,900	178,000
August	----------	635	786	48,300
September	1,410	356	659	39,200
The year	----------	356	2,210	1,600,000

Digitized by Google

GUADALUPE RIVER SEEPAGE INVESTIGATION

During the investigation the river was at a constant stage and discharge represents the natural conditions.

Discharge measurements to determine seepage on Guadalupe River from Comfort to New Braunfels, Tex., in February, 1929

Date	Stream or diversion	Location	Approximate distance from initial point in miles	Discharge in second-feet			
				Main stream	Tributary	Gain or loss in section	Total seepage gain or loss
Feb. 18	Guadalupe River	Gaging station 2 miles above Comfort.	0	41.1			
Do	Cypress Creek	One-fourth mile above mouth at Comfort.	3.0		0.2		
Do	Holliday Creek	One-fourth mile above mouth below Comfort.	4.8		0		
Do	Guadalupe River	San Antonio & Aransas Pass Railway bridge near Comfort.	6.4	42.5		+1.2	+1.2
Do	do	Waring	12.2	36.4		−6.1	−4.9
Feb. 19	Joshua Creek	2 miles above mouth near Waring.	16.0		.7		
Do	Sister Creek	One-half mile above mouth, near Sisterdale.	19.7		.2		
Do	Guadalupe River	Just below mouth of creek at Sisterdale.	19.7	45.2		+7.9	+3.0
Do	Wasp Creek	Mouth, about 6 miles below Sisterdale.	29.5		0		
Do	Guadalupe River	Just above mouth of Sabino Creek at Ammans crossing.	31.0	40.7		−4.5	−1.5
Do	Sabino Creek	One-fourth mile above mouth 8 miles northeast of Boerne.	31.2		.3		
Do	Guadalupe River	Unknown crossing about 4 miles north of Oberlys crossing.	34.2	38.2		−2.8	−4.3
Feb. 20	do	Schillers crossing 4 miles northeast of Bergheim.	45.6	43.0		+4.8	+0.5
Do	Currys Creek	One-half mile above mouth, 4 miles above Spring Branch.	55.8		1.0		
Do	Guadalupe River	Specks crossing 2.5 miles southwest of Spring Branch.	57.5	47.7		+3.7	+4.2
Do	Spring Branch	1½ miles above mouth near Spring Branch.	59.0		.9		
Do	Guadalupe River	Gaging station near Spring Branch.	61.7	47.4		−1.2	+3.0
Feb. 21	do	In Demijohn Bend east of Spring Branch.	73.3	34.3		−13.1	−10.1
Do	Big Spring	Cranes Mill	78.5		2.9		
Do	Guadalupe River	Below Big Spring at Cranes Mill.	78.5	39.2		+2.0	−8.1
Do	do	5 miles northwest Sattlers store near Craasies gin.	86.2	48.8		+9.6	+1.5
Feb. 22	do	2 miles northeast of Sattlers store.	94.0	48.2		−.6	+.9
Do	Jacobs Creek	Mouth 2 miles below Sattlers store.	95.9		.1		
Do	Guadalupe River	4 miles below Sattlers store.	97.4	53.1		+4.8	+5.7
Do	Isaacs Creek	Mouth about 5½ miles above New Braunfels.	103.5		0		
Do	Guadalupe River	2 miles above confluence of Elm Creek, above New Braunfels.	104.1	53.0		−.1	+5.6
Do	Elm Creek	Mouth near New Braunfels	104.3		0		
Do	Guadalupe River	Above gaging station at New Braunfels.	108.7	*49.0		−4.0	+1.6

* Mean discharge for 24-hour period used because of fluctuation caused by Gode's small power plant.

Digitized by Google

COMAL RIVER AT NEW BRAUNFELS, TEX.

LOCATION.—Water-stage recorder 200 feet upstream from San Antonio Street viaduct in New Braunfels, Comal County. Zero of gage, 582.61 feet above mean sea level.

RECORDS AVAILABLE.—December, 1927, to September, 1929.

EXTREMES.—Maximum discharge during year not determined (gage height, 12.13 feet May 30); minimum, 142 second-feet Dec. 11 (gage height, 2.12 feet).

1927–1929: Maximum discharge not determined (gage height, that of May 30, 1929); minimum, that of Dec. 11, 1928.

The flood of December, 1913, reached a stage of 35.8 feet (probably some backwater from Guadalupe River).

REMARKS.—Records for low stages fair, for medium and high stages poor. About 635 acres has been declared irrigated above station. Flow partly regulated by steam power plant half a mile upstream.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	280	280	275	278	278	272	283	280	379	297	322	302
2	280	275	278	275	282	272	270	280	331	297	322	300
3	280	275	278	278	278	272	264	280	325	300	322	300
4	278	272	278	300	275	283	264	275	319	302	322	300
5	275	289	278	335	278	278	262	272	316	------	322	300
6	278	283	278	286	278	278	262	272	314	------	319	
7		278	275	283	278	278	262	270	314	------	319	
8		280	275	280	275	280	275	270	311	328	319	
9		278	275	280	278	278	288	270	311	322	319	
10		278	283	280	272	278	267	267	302	319	316	
11	*282	278	267	278	275	278	270	267	302	319	316	*302
12		280	286	278	275	388	280	270	294	316	316	
13		280	278	283	272	278	280	275	294	336	314	
14		280	286	280	278	267	300	272	297	319	314	
15		278	291	280	272	264	280	275	291	311	314	
16	*300	275	283	280	275	259	280	275	291	319	305	*305
17	286	275	289	286	275	264	283	283	289	325	305	302
18	283	275	283	278	272	259	280	302	294	325	302	302
19	283	275	286	278	272	259	280	272	297	325	302	300
20	289	275	286	278	275	264	280	278	297	322	302	297
21	286	272	289	280	270	272	280	275	302	325	302	297
22	283	275	289	280	270	270	278	280	294	325	308	294
23	283	272	286	278	272	267	270	278	294	319	305	294
24	283	275	278	278	272	262	270	322	294	322	302	294
25	282	275	278	280	272	262	270	372	294	322	305	294
26	289	278	278	278	272	264	280	------	294	331	300	297
27	289	272	275	275	272	264	278	297	294	325	302	300
28	283	272	275	280	275	264	278	------	297	325	300	297
29	283	272	278	278	------	264	270	------	354	325	302	297
30	280	278	280	280	------	264	278	------	308	322	300	297
31	280	------	280	278	------	267	---	------	------	322	300	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	------	------	283	17,400
November	299	272	277	16,500
December	291	267	280	17,200
January	33[illegible]	275	282	17,300
February	27[illegible]	270	274	15,200
March	38[illegible]	259	273	16,800
April	30[illegible]	262	277	16,500
May	------	267	------	------
June	37[illegible]	289	306	18,200
July	------	297	------	------
August	32[illegible]	300	310	19,100
September	------	------	300	17,900

* Estimated.

NOTE.—Mean daily gage height beyond limits of rating curve May 26. Backwater effect May 28–31 and July 5–7; discharge not determined.

Digitized by Google

BLANCO RIVER AT WIMBERLEY, TEX.

LOCATION.—Water-stage recorder 800 feet below mouth of Cypress Creek and one-fourth mile south of Wimberley, Hays County.

DRAINAGE AREA.—378 square miles.

RECORDS AVAILABLE.—August, 1924, to September, 1926; and June, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 113,000 second-feet May 28, determined by slope-area method (gage height, 31.10 feet); minimum, 7.4 second-feet October 1–5, 9, 13–16, 18, 21, and 22 (gage height, 0.33 foot).

1924–1926, 1928–29: Maximum discharge, that of May 28, 1929; minimum, 4.0 second-feet Sept. 20, 1928 (gage height, 0.30 foot).

REMARKS.—Records fair. No diversions.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.4	*9.0	18	13	13	9.0	18	34	*1,220	114	92	37
2	7.4	9.0	16	13	13	9.0	18	33	*1,010	92	86	37
3	7.4	8.2	18	13	13	8.2	18	31	*791	481	81	35
4	7.4	8.2	17	179	14	9.0	17	29	*597	342	76	35
5	7.4	12	17	56	14	9.0	17	29	*480	434	74	33
6	8.2	17	21	27	14	9.0	16	29	*555	2,580	71	33
7	8.2	10	24	23	14	9.0	28	29	692	600	67	33
8	8.2	9.0	21	20	16	9.0	160	26	341	421	64	33
9	7.4	9.0	20	18	14	9.0	836	26	314	346	62	33
10	8.2	9.0	23	17	14	9.0	103	181	278	304	60	33
11	8.2	9.0	24	17	13	10	55	62	252	278	58	33
12	8.2	8.2	21	17	13	16	54	44	223	269	55	33
13	7.4	8.2	23	17	12	20	50	146	211	252	53	33
14	7.4	8.2	27	16	12	17	508	174	195	223	53	33
15	7.4	8.2	14	16	12	14	223	75	188	207	51	33
16	7.4	8.2	17	16	12	14	98	82	174	192		37
17	8.2	10	21	14	12	13	77	60	163	181		33
18	7.4	11	18	14	11	13	62	132	150	167		33
19	10	12	16	14	11	13	56	103	141	167	*47	33
20	9.0	12	16	14	10	14	56	56	134	153		33
21	7.4	12	16	13	10	18	50	42	128	147		31
22	7.4	12	14	13	9.0	18	54	34	119	141		30
23	9.0	12	13	13	9.0	18	58	29	114	131	43	30
24	8.2	12	13	13	9.0	17	52	676	108	128	43	30
25	8.2	13	13	13	10	17	44	176	102	122	43	28
26	8.2	14	13	12	10	17	40	431	97	119	43	27
27	9.0	16	13	13	10	17	38	120	92	116	43	27
28	*9.0	18	13	13	10	17	38	*29,200	92	125	41	27
29	*9.0	16	13	13	-------	18	34	*5,910	102	111	41	25
30	*9.0	18	13	13	-------	18	34	*2,560	134	102	39	25
31	*9.0	-------	13	13	-------	18	-------	*1,600	-------	97	37	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	10	7.4	8.10	498
November	18	8.2	11.4	678
December	27	13	17.5	1,070
January	179	12	21.8	1,340
February	16	9.0	11.9	661
March	20	8.2	13.7	842
April	836	16	97.2	5,780
May	29,200	26	1,360	83,600
June	1,330	92	311	18,500
July	2,580	92	295	18,100
August	92	37	55.0	3,380
September	37	25	31.9	1,900
The year	29,200	7.4	188	136,000

*Estimated.

Digitized by Google

SAN MARCOS RIVER AT OTTINE, TEX.

LOCATION.—Water-stage recorder at highway bridge one-fourth mile southwest of Ottine, Gonzales County.

DRAINAGE AREA.—1,250 square miles.

RECORDS AVAILABLE.—June, 1915, to September, 1929.

EXTREMES.—Maximum discharge during year, about 202,000 second-feet May 29 (gage height, 43.32 feet); minimum, 31 second-feet Oct. 10.

1915–1929: Maximum discharge, that of May 29, 1929; no flow July 29, 1923, Mar. 31, 1925, and June 24, 1926.

REMARKS.—Records fair except those for estimated periods, which are poor. Diversions above station for irrigation and municipal use are small. Flow regulated by operation of small cotton gin above gage. Most of normal flow from large springs near San Marcos.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	79	94	124	168	150	125		177	*4,870	396	323	223
2	133	104	129	154	130	122		160	*2,320	404	323	
3	121	101	105	156	140	123		152	*1,680	379	315	
4	96	96	128	220	141	145		159	*1,450	529	307	
5	102	143	120	655	124	148	*157	161	*1,300	850	299	
6	88	434	121	489	161	133		152	*1,140	635	299	*218
7	96	215	142	252	146	135		157	*1,020	2,220	283	
8	82	121	140	216	123	141	*444	1c4	*595	1,220	253	
9	97	120	127	185	145	128	7,940	14e	53e	775	253	
10	79	104	168	17b	123	130	4,140	148	775	6b5	275	
11	72	104	371	154	135	146	483	146	715	615	275	*202
12	78	111	223	168	119	467	339	216	675	557	268	209
13	90	110	167	157	137	3,910	3,000	307	635	540	265	209
14	90	1.3	155	152	133	691	3,960	405	595	523	245	230
15	82	106	198	151	125	258	1,6s0	614	615	4s0	252	223
16	111	113	127	154	134		599	387	595	472	252	326
17	170	137	166	139	119		347	1,660	540	446	252	749
18	94	115	164	157	134		283	3,640	506	438	275	234
19	101	92	154	161	123	*174	245	1,520	480	421	252	216
20	110	120	164	178	137			299	472	719	245	209
21	81	103	161	128	124		*195	252	455	580	238	202
22	76	116	156	146	133	*265		*209	446	430	230	199
23	90	113	148	151	123	*250		*177	430	404	230	187
24	97	111	175	154	118			8,610	412	412	238	189
25	90	103	151	154	137		202	8,770	404	741	230	194
26	96	99	163	141	124		198	3,310	396	766	230	194
27	115	94	160	135	137	*157	184	4,430	421	493	230	192
28	97	116	164	146	125		184	7,700	396	421	230	185
29	90	120	164	140	-------		180	118,000	430	363	223	188
30	98	129	164	156	-------		181	20,400	412	355	223	180
31	102	-------	156	136	-------		-------	11,700	-------	339	223	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	170	72	96.9	5,960
November	434	92	125	7,440
December	371	105	161	9,900
January	655	128	188	11,600
February	161	118	132	7,330
March	3,910	122	310	19,100
April	7,940	-------	889	52,930
May	118,000	146	6,270	386,000
June	4,870	396	878	52,200
July	2,220	339	600	36,900
August	323	223	261	16,000
September	749	180	230	13,700
The year	118,000	72	854	619,000

* Estimated.

Digitized by Google

PLUM CREEK NEAR LOCKHART, TEX.

LOCATION.—Staff gage at steel highway bridge 700 feet below mouth of Dry Creek and 7 miles southeast of Lockhart, Caldwell County. Zero of gage, 371.39 feet above mean sea level.

DRAINAGE AREA.—184 square miles.

RECORDS AVAILABLE.—January, 1925, to September, 1929.

EXTREMES.—Maximum discharge during year, about 25,200 second-feet May 28 (gage height, 22.50 feet); no flow Aug. 30 to Sept. 2, Sept. 4 and 5.

1925–1929: Maximum discharge, about 26,000 second-feet Apr. 21, 1926 (gage height, 22.6 feet from floodmarks); no flow during several periods.

The flood of December, 1913, reached a stage of 26.8 feet, determined by levels to floodmarks.

REMARKS.—Records poor. Discharge estimated Feb. 8–11. No diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.5	0.5	1.0	0.8	1.5	1.3	0.8	1.7	303	2.7	1.0	0.0
2	.5	.4	.9	.8	1.6	1.3	.7	1.2	92	2.9	.8	0
3	.4	.5	1.0	.8	1.5	1.3	.8	1.0	43	78	.7	.1
4	.4	.5	1.0	17	1.5	4.0	.7	.8	43	176	.5	0
5	.5	2.4	1.0	33	1.5	2.8	.7	.7	38	51	.4	0
6	.5	59	1.9	14	1.4	1.4	.7	.7	34	13	.3	.1
7	.5	2.7	3.0	4.9	1.3	1.2	.7	.6	25	264	.3	.1
8	.5	1.1	2.4	2.7	1.2	1.3	2 070	.6	14	123	.3	.1
9	.4	1.0	1.3	2.5	1.1	1.5	2, 700	.6	12	16	.2	.1
10	.4	.8	19	2.0	1.0	1.7	98	.5	12	12	.1	.1
11	.4	.8	38	1.4	.9	3.0	19	.5	11	12	.1	.1
12	.5	.7	2.6	1.3	1.1	499	26	.5	9.7	8.4	.2	.1
13	.5	.7	1.1	1.3	1.4	372	1, 010	4.0	8.8	3.4	.3	.1
14	.5	.7	1.0	1.3	1.3	58	448	26	7.6	1.6	.3	.1
15	.5	.6	.9	1.4	1.3	15	196	43	20	1.5	.2	.2
16	.6	.6	1.6	1.4	1.3	5.2	20	48	14	1.2	.2	.4
17	.7	.6	8.9	1.4	1.2	3.8	11	614	6.7	1.0	.2	.3
18	.7	.6	5.6	1.4	1.2	3.2	5.9	712	5.9	.9	.1	.2
19	.6	.5	3.8	1.4	1.3	2.3	4.2	420	5.3	9.6	.1	.2
20	.6	.4	2.3	1.4	1.2	2.0	3.0	42	4.7	83	.2	.1
21	.5	.5	1.0	1.5	1.2	53	2.6	11	4.4	28	.3	.1
22	.5	.4	.7	1.4	1.2	111	2.4	4.6	4.0	13	.3	.1
23	.5	.4	.7	1.6	1.2	22	2.3	2.6	3.8	11	.3	.1
24	.5	.6	.7	1.4	1.2	7.9	2.3	815	3.8	9.5	.3	.1
25	.4	1.0	.7	1.2	1.3	2.8	1.8	284	3.1	8.2	.3	.2
26	.4	1.0	.8	1.2	1.4	1.9	1.6	1, 370	2.8	17	.3	.3
27	.4	1.0	.7	1.1	1.4	1.6	1.5	352	2.5	69	.3	.2
28	.4	1.0	.8	1.0	1.3	1.3	1.5	12, 500	2.4	11	.2	.3
29	.4	1.0	.7	1.2	-------	1.1	1.4	12, 500	3.6	6.8	.1	.3
30	.5	1.0	.8	1.3	-------	1.0	1.4	2, 040	3.0	3.8	0	.3
31	.5	-------	.5	1.5	-------	.9	---------	284	-------	1.6	0	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	0.7	0.4	0.49	30
November	59	.4	2.76	164
December	38	.5	3.43	211
January	33	.8	3.44	212
February	1.6	.9	1.29	72
March	499	.9	38.3	2, 360
April	2, 700	.7	221	13, 200
May	12, 500	.5	1, 030	63, 300
June	303	2.4	24.8	1, 480
July	264	.9	33.6	2, 070
August	1.0	0	.29	18
September	.4	0	.15	8.9
The year	12, 500	0	115	83, 100

Digitized by Google

SAN ANTONIO RIVER AT SAN ANTONIO, TEX.

LOCATION.—Water-stage recorder at South Alamo Street bridge in San Antonio, Bexar County. Zero of gage, 619.72 feet above mean sea level.

DRAINAGE AREA.—38 square miles.

RECORDS AVAILABLE.—January, 1915, to November, 1929; discontinued.

EXTREMES.—1915–1929: Maximum discharge by slope-area method, 15,300 second-feet Sept. 10, 1921 (gage height, 20.14 feet, from floodmarks); no flow during several periods owing to regulation.

REMARKS.—Records poor. Diversions above gage not known but believed to be small. Operation of mill just above gage causes sharp diurnal fluctuations. The normal flow of river comes from springs. Changes in mean daily stage during low flow are probably caused by pumping from wells for city water supply and for irrigation, thereby depleting underground reservoir.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	17		17	13	9.0		12	16	*32	19	7.0		22	35
2	18	*15	12	12	*10		13	13	24	19	14		26	41
3	25		12	14			13	16	27	24	16		25	43
4	12		12	104			13	13	26	25	16	*22	25	44
5	12	*100	9.0	22			14	14	30	29	10		22	42
6	19		67	11		*9.0	13	10	18	72	15		21	38
7	16	*15	16	13			13	13	24	24	17	29	25	37
8	15		*11	15			81	13	23	21	9.0	21	25	38
9	16			31			23	11	24	24	12	29	24	72
10	16	*16		16			23	15	23	25	15	34	35	30
11	16	15	*15	16		*20	15	14	22	29		36	22	30
12	17	15		15			13	22	26	28		24	29	33
13	17	17		15		25	15	37	14	33		27	23	31
14	16	15		17		10	32	15	22	22	*20	74	28	33
15	19	15	*8.0	19		10	16	15	23	26		27	43	30
16		14	11	17	*9.0	9.0	15	65	22	26		71	26	31
17	*41		15	18		7.2	15	61	22	29	*20	24	30	------
18			11	18		17	15	24	22	19	17	25	30	------
19			11	16		12	16	12	26	22	20	23	*29	------
20	*14	*14	10	14		22	17	15	17	21	20	23	*32	------
21	16		11	16		57	16	17	22	22	27	25	33	------
22	14		11	18		17	16	20	21	18	16	20	29	------
23	16		11	12		12	16	15	*18	18	20	21	31	------
24		*14	13	12		11	16	132	*16	21	28	19	33	------
25		12	13	10		12	15	46	18	11	20	18	34	------
26		13	14	10		12	13	*33	23	16	25	30	68	------
27	*15	14	13	8.6		12	15	*20	14	17	28	18	44	------
28		13	15	10		12	*16	59	31	15	28	20	38	------
29		12	16	10	------	12	17	41	72	12	19	17	34	------
30		11	15	10	------	12	16	17	14	16	21	22	36	------
31		------	9.0	8.0	------	11	------	*23	------	18	*20	------	50	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1928–29				
October	----------	----------	19.2	1,180
November	----------	11	17.1	1,020
December	67	8.0	14.6	898
January	104	8.6	17.5	1,080
February	----------	----------	9.04	502
March	57	----------	13.6	836
April	81	12	18.1	1,080
May	132	10	27.0	1,660
June	72	14	23.9	1,420
July	72	11	23.3	1,430
August	----------	7.0	18.7	1,150
September	74	17	27.0	1,610
The year	132	7.0	19.1	13,900
1929				
October	68	21	31.4	1,930
November 1–16	72	30	38.0	1,210
The period	----------	----------	----------	3,140

* Estimated.

Digitized by Google

SAN ANTONIO RIVER NEAR FALLS CITY, TEX.

LOCATION.—Water-stage recorder at highway bridge half a mile above Scared Dog Creek and 3.4 miles southwest of Falls City, Karnes County.

DRAINAGE AREA.—2,070 square miles.

RECORDS AVAILABLE.—April, 1925, to September, 1929.

EXTREMES.—Maximum discharge during year, 10,100 second-feet May 29 (gage height, 11.15 feet); minimum, 54 second-feet Apr. 3, 6, and 7.

1925–1929: Maximum discharge, that of May 29, 1929; minimum, 36 second-feet May 11 and 12, 1928 (gage height, 0.97 feet).

In 1913 river reached stage of 28.36 feet (from floodmarks).

REMARKS.—Records good except those for estimated periods, which are fair. For diversions see records of Medina Canal near Riomedina. Slight regulation caused by operation of Medina Dam.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	71	78	140	109	109	124	60	98	1,340		81	74
2	71	84	140	109	114	109	57	98	1,070		78	74
3	64	84	145	109	119	106	54	95	364		78	78
4	64	81	140	119	114	109	60	92	281		74	84
5	60	452	134	160	124	109	57	95	237	400	71	88
6	64	1,740	145	182	124	124	54	95	226		71	92
7	60	661	145	220	124	119	54	95	210		74	95
8	60	308	325	232	134	114	350	95	193		71	95
9	60		281	226	134	109	1,720	92	188	642	78	98
10	60		545	204	124	102	298	92	188	375	78	106
11	64		434	176	119	140	264	92	182	226	74	106
12	64		270	155	114	119	254	95	176	166	74	109
13	74		215	124	109	232	171	102	171	176	74	119
14	74		182	109	109	166	259	144	171	415	74	129
15	71		102	106	119	347	242	331	166	314	78	140
16	67		88	114	129	347	182	306	155	140	78	145
17	331		92	109	129	155	155	676	140	109	81	145
18	748		95	106	109	88	119	2,080	150	106	78	232
19	226	125	98	106	119	88	114	2,120	145	98	71	160
20	109		198	102	119	95	109	1,670	134	95	71	106
21	84		102	102	114	1,050	166	616	129	95	71	98
22	81		92	102	114	171	106	392	119	92	74	95
23	167		84	98	124	308	109	231	106	92	74	92
24	444		84	98	114	155	140	292	102	88	74	92
25	196		84	98	114	84	150	1,740	106	88	71	95
26	78		84	98	124	74	276	2,810	106	124	71	102
27	78		84	106	124	67	166	2,910	102	98	74	95
28	74		84	106	124	60	98	3,220	106	98	74	95
29	71		88	106	------	60	98	8,080	102	92	74	95
30	78		88	102	------	64	98	8,480	102	88	74	95
31	74	------	92	109	------	64	------	3,710	------	84	74	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	748	60	125	7,690
November	1,740	----------	208	12,400
December	545	84	157	9,650
January	232	98	129	7,930
February	134	109	120	6,660
March	1,050	60	163	10,000
April	1,720	54	199	11,800
May	8,480	92	1,330	81,800
June	1,340	102	232	13,800
July	----------	84	229	14,100
August	81	71	74.6	4,590
September	232	74	108	6,430
The year	8,480	54	258	187,000

Digitized by Google

SAN ANTONIO RIVER AT GOLIAD, TEX.

LOCATION.—Chain gage on Galveston, Harrisburg & San Antonio Railway bridge in Goliad County.

DRAINAGE AREA.—3,910 square miles.

RECORDS AVAILABLE.—June, 1924, to March, 1929, when station was discontinued.

EXTREMES.—Maximum discharge during period, 13,100 second-feet Jan. 11 (gage height, 31.79 feet); minimum, 70 second-feet Oct. 10–15.

1924–1929: Maximum discharge, that of Jan. 11, 1929; minimum, 44 second-feet for several periods during 1927.

REMARKS.—Monthly records poor. Records of daily discharge not sufficiently accurate for publication. For diversions see record of Medina Canal near Riomedina.

Monthly discharge, in second-feet, 1928–29

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	274	70	136	8,360
November	8,100	92	764	45,500
December	1,240	104	289	17,800
January, 24–31	151	141	142	2,260
February	131	104	121	6,720
March	10,200	122	845	52,000

NOTE.—No record Jan. 1–23.

SAN PEDRO CREEK AT SAN ANTONIO, TEX.

LOCATION.—Water-stage recorder at Missouri-Kansas-Texas Railroad culvert, 200 feet south of Arsenal Street in San Antonio, Bexar County, 1 mile above mouth of Salsamora and Martinez Creeks, and 2½ miles above confluence with San Antonio River.

RECORDS AVAILABLE.—July, 1916, to November, 1929, when station was discontinued.

EXTREMES.—Maximum discharge during year, 728 second-feet May 23 (gage height, 5.00 feet); minimum, 0.9 second-foot Dec. 13 and 14.

1916–1929: Maximum discharge not determined (gage height, 8.6 feet Sept. 9, 1921, when backwater from Alizan Creek existed); no flow Aug. 16, 1926, and May 23, 1928.

REMARKS.—Records fair. No diversions. Flow partly regulated at small swimming pool dam above station. Entire flow of San Pedro Creek, except during times of heavy precipitation, is furnished by San Pedro Springs 2 miles upstream and flow at this station is believed to be that which reaches San Antonio River. Martinez and Salsamora Creeks carry no water, except during heavy local rains, and have been known to be dry for several years at a time.

Digitized by Google

Daily and monthly discharge, in second-feet, of San Pedro Creek at San Antonio, Tex., 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	1.9	3.1	3.1	3.7	2.5	2.5	3.7		4.0	3.8	5.3	4.0	3.1	2.8
2	1.9	2.5	2.8	5.9	[a] 3.7	[a] 3.4	3.7		4.8	4.0	2.5	5.0	4.7	3.7
3	2.2	1.3	2.5	3.7	3.7		4.4		5.6	2.8	4.0	3.7	2.8	3.7
4	3.4	2.2	2.5	35	3.7		3.4		3.1	5.8	4.4	3.4	3.1	3.1
5	3.1	24	2.5	5.6	3.7		4.4	[a] 3.5	4.4	6.3	5.6	5.5	3.4	3.1
6	2.8	4.0	19	4.8	6.0	[a] 3.7	3.4		5.5	16	2.9	3.2	3.4	2.8
7	2.8	5.8	5.6	4.8	4.0		2.2		3.1	4.8	4.0	2.5	3.7	4.9
8	3.1	3.4	3.1	5.2	3.4		21		4.4	6.8	5.6	3.7	3.4	4.0
9	2.8	2.2	2.2	11	2.5	[a] 3.1	4.8	3.2	4.4	3.1	3.1	5.2	4.5	16
10	2.5	3.1	15	6.4	3.1	3.7	6.2	4.2	5.5	4.4	3.1	2.9	1.9	3.7
11	2.5	3.1	3.7	4.0	3.4	19	6.0	1.9	2.5	10		3.4	2.5	3.7
12	2.8	3.1	5.9	5.2	3.7	5.3	[a] 3.4	6.2	3.4	4.4		5.4	4.0	4.4
13	2.8	3.1	2.2	5.2	5.6	11	3.7	15	4.5	8.3		2.7	3.1	3.7
14	3.1	3.1	1.1	5.2	3.7	5.2	8.8	4.8	1.9	5.6	[a] 5.0	7.2	3.4	3.7
15	2.8	4.8	2.8	5.6	2.2	4.0	[a] 4.8	4.8	2.5	6.6		4.3	5.3	3.7
16	26	2.4	3.1	8.9	3.4	4.4			2.8	4.8		20	3.4	3.7
17	6.8	2.8	5.2	4.8	3.4	4.4			3.6	5.6	[a] 3.4	3.7	3.4	
18	4.4	2.8	3.1	3.7	3.4	4.4			1.8	5.4	4.0	3.4	3.4	
19	3.1	2.8	5.1	4.0	3.7	4.4			2.8	4.0	5.8	3.4	3.7	
20	3.7	2.8	3.4	4.0	6.2	8.8			4.5	4.8	2.9	3.4	3.1	[a] 3.7
21	4.0	4.5	1.9	4.0	3.7	22			2.6	5.2	3.7	3.4	3.1	
22	3.7	3.1	3.1	3.7	2.5	4.0			[a] 3.1	5.9	5.7	3.4	3.4	
23	4.4	1.9	3.4	5.7	3.1	3.7	[a] 4.0	[a] 12	[a] 3.8	4.1	3.1	3.4	3.4	[a] 4.0
24	5.5	1.9	3.4	3.4	3.4	3.7			[a] 4.6	4.4	3.4	3.4	[a] 3.4	6.5
25	3.4	2.2	3.1	2.5	3.4	3.4			3.2	5.8	4.4	4.7	[a] 3.4	11
26	1.9	2.5	5.4	2.8	3.7	3.1			3.1	3.1	5.2	1.9	7.6	4.8
27	3.1	4.0	3.7		6.1	3.1			4.4	4.4	4.0	2.8	4.8	4.4
28	3.4	2.6	3.7		3.7	3.4			26	4.8	3.7	3.1	3.7	4.4
29	3.4	1.6	2.8	[a] 3.5	------	3.4			10	5.8	5.4	3.1	3.7	4.4
30	3.1	3.1	2.2		------	3.4			4.0	2.9	3.1	3.1	4.8	4.4
31	4.9	------	3.1		------	3.7	------		------	4.0	2.8	------	2.2	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1928–29				
October	26	1.9	4.04	248
November	24	1.3	3.66	218
December	19	1.1	4.18	257
January	35	------	5.69	350
February	6.2	2.2	3.74	208
March	22	------	5.25	323
April	21	------	4.80	286
May	------	------	8.39	516
June	26	1.8	4.66	277
July	16	2.8	5.41	333
August	------	------	4.23	260
September	20	1.9	4.28	255
The year	------	1.1	4.88	3,530
1929				
October	7.6	1.9	3.64	224
November	16	------	4.56	271
The period	------	------	------	495

[a] Estimated.

Digitized by Google

MEDINA RIVER NEAR PIPE CREEK, TEX.

LOCATION.—Water-stage recorder 3½ miles above mouth of Pipe Creek and 4 miles southwest of Pipe Creek post office, Bandera County.
DRAINAGE AREA.—412 square miles.
RECORDS AVAILABLE.—December, 1922, to September, 1929.
EXTREMES.—Maximum discharge during year not determined (gage height, 18.25 feet May 13); minimum, 2.7 second-feet Oct. 1, 4–8, and 11–15.
1923–1929: Maximum discharge not determined (gage height, 19.8 feet Apr. 21, 1926); minimum, 2.2 second-feet Sept. 9, 1927.
The flood of 1919 reached a stage of about 42 feet.
REMARKS.—Records for low stages fair and for high stages poor. No diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1	2.7	9.2	*14	*27	*19	12	14	9.2	244	60	22	6.8
2	3.2	8.0	*16	24	*19	12	14	8.0	183	33	20	8.0
3	3.2	*8.0	16	12	*20	12	16	8.0	166	973	18	8.0
4	2.7	*8.0	16	12	22	12	16	6.8	139	147	15	8.0
5	2.7	8.0	16	16	24	12	16	6.6	123	322	20	8.0
6	2.7	8.0	16	*20	24	12	14	6.8	106	180	16	8.0
7	2.7	9.2	18	20	20	12	12	6.8	93	89	16	8.0
8	2.7	6.8	18	22	*20	12	16	6.8	86	84	14	8.0
9	3.2	8.0	16	20	*18	12	16	6.8	72	67	14	11
10	3.2	9.2	14	22	*16	14	18	6.8	44	60	11	12
11	2.7	9.2	14	*22	*16	16	20	5.8	42	60	11	12
12	2.7	9.2	16	*20	*16	20	20	1,140	11	60	11	14
13	2.7		16	18	*15	20	20	3,250	14	52	11	16
14	2.7		16	18	*15	22	22	262	33	60	11	18
15	2.7	*11	16	18	*15	18	18	161	35	31	9.2	18
16	*250		85	20	*14	18	14	131	42	29	9.2	18
17	*144		100	20	*14	16	16	256	42	29	9.2	20
18	*84	9.2	81	20	12	16	16	305	42	27	9.2	20
19	*44	5.8	79	*20	12	16	16	100	40	24	9.2	22
20	*20	5.8	*68	*20	12	33	16	62	35	27	9.2	24
21	*9.2	5.8	*56	20	12	64	16	42	33	29	9.2	29
22	6.8	8.0	*45	20	14	27	18	35	29	27	9.2	29
23	5.8	11	*33	20	*14	22	16	33	27	22	9.2	31
24	4.8		22	18	*14	18	16	167	24	22	9.2	24
25	3.9		20	20	16	18	14	111	38	24	9.2	20
26	3.2		22	18	16	16	12	946	30	22	9.2	18
27	3.2	*14	*22	18	14	16	12	326	20	47	9.2	14
28	8.0		*23	20	14	16	11	2,860	18	31	9.2	12
29	8.0		*24	20	-------	14	9.2	1,650	462	27	8.0	9.2
30	8.0		*25	20	-------	16	9.2	528	81	24	8.0	8.0
31	8.0	-------	*26	18	-------	16	-------	350	-------	24	8.0	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	250	2.7	21.1	1,300
November	----------	5.8	9.98	594
December	100	14	31.3	1,920
January	27	12	19.5	1,200
February	24	12	16.3	905
March	64	12	18.1	1,110
April	22	9.2	15.4	916
May	3,250	5.8	413	25,400
June	462	11	78.5	4,670
July	973	22	57.5	5,380
August	22	8.0	11.8	726
September	31	6.8	15.4	916
The year	3,250	2.7	62.2	45,000

* Estimated.

Digitized by Google

MEDINA RIVER NEAR RIOMEDINA, TEX.

LOCATION.—Water-stage recorder just above Medina Valley Irrigation Co.'s diversion dam 6 miles northwest of Riomedina, Medina County.
DRAINAGE AREA.—606 square miles.
RECORDS AVAILABLE.—January, 1922, to September, 1929.
EXTREMES.—No flow over dam during year.
1922–1929: Maximum discharge, about 11,800 second-feet Apr. 21, 1926 (gage height, 5.17 feet); no flow over dam during several periods.
REMARKS.—Yearly record fair. Record of monthly seepage not sufficiently accurate for publication. Water to irrigate about 5,000 acres is diverted to Medina Canal above gage; see "Medina Canal near Riomedina." Flow regulated by main storage dam, 4 miles upstream, except when main reservoir is full and water flows over spillway. Medina Valley Irrigation Co. furnishes daily gage readings of lake level which are used to determine seepage.

Seepage past diversion dam, measured at Haby crossing, 1 mile downstream, was 16,900 acre-feet for year ending Sept. 30, 1929.

Digitized by Google

MEDINA CANAL NEAR RIOMEDINA, TEX.

LOCATION.—Water-stage recorder just above upper end of flume No. 1, one-third of a mile below head of canal and 6 miles north of Riomedina, Medina County.
RECORDS AVAILABLE.—March, 1922, to September, 1929.
EXTREMES.—Maximum discharge during year, 116 second-feet Aug. 13 (gage height, 2.05 feet); no flow during several periods.
1922–1929: Maximum discharge, 128 second-feet June 26, 1923, and June 5 and 6, 1925; no flow during several periods.
REMARKS.—Records fair. Station is above all diversions from canal. Flow controlled by head gates. Canal diverts from Medina River for irrigation near Lacoste and Natalia.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	17		18	14	16	8.4	24	0.9	16	32	42
2	14	17		18	13	16	5.6	27	.2	23	32	41
3	19	17		18	14	16	5.7	42	.1	18	33	42
4		17		18	15	14	4.4	40	3.2	14	34	40
5		17	*19	18	15	17	9.2	52	10	12	38	36
6		17		17	15	16	22	58	15	2.0	52	40
7		17		17	15	16	25	62	14	2.0	54	54
8		17		16	10	16	28	72	14	2.3	61	54
9		17	*19	19	7.2	15	26	72	20	2.1	80	54
10		17	19	20	7.0	16	28	78	21	1.2	70	52
11		17	12	20	6.7	19	24	84	27	.1	39	49
12		19	5.6	19	6.7	16	29	63	28	1.7	72	52
13		20	3.4	19	8.2	16	28	26	35	5.6	108	52
14		17	3.3	18	12	15	14	18	46	20	95	47
15		15	3.1	19	17	16	5.8	15	60	20	87	52
16	*21	15	2.8	19	15	16	4.7	15	90	20	91	26
17		17	3.3	19	15	16	13	15	84	22	90	14
18		17	3.6	18	15	12	18	15	79	25	88	18
19		*19	2.8	17	15	12	18	1.8	102	25	87	20
20			0	17	15	12	18	9.2	94	23	86	20
21			0	17	16	13	13	14	88	22	86	20
22			0	17	15	17	3.3	15	88	21	73	32
23			0	15	15	17	3.1	15	87	25	66	37
24			0	6.7	15	16	3.0	12	88	31	57	37
25			*19	0	6.3	16	16	2.8	5.9	74	43	52	38
26			8.9	6.5	16	16	15	2.4	60	49	50	39
27			19	12	15	17	18	0	64	48	51	39
28			26	15	16	16	18	0	66	49	48	39
29			19	13	-------	16	17	.1	16	44	58	38
30	*19		17	14	-------	15	17	.1	15	32	48	38
31	19	-------	17	14	-------	15	-------	.8	-------	32	42	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	----------	----------	20.4	1,250
November	----------	15	17.8	1,060
December (25 days)	26	2.8	13.5	668
January	20	6.3	16.1	990
February	17	6.7	13.4	744
March	19	12	15.5	953
April	29	2.8	14.8	881
May (29 days)	84	.1	29.5	1,690
June	102	.1	46.3	2,760
July	49	.1	21.0	1,290
August	108	32	63.2	3,890
September	54	14	38.7	2,300
The year	----------	----------	----------	18,500

* Estimated.

Digitized by Google

CIBOLO CREEK AT SUTHERLAND SPRINGS, TEX.

LOCATION.—Staff gage at highway bridge in Sutherland Springs, Wilson County, 5½ miles below mouth of Elm Creek.

DRAINAGE AREA.—665 square miles.

RECORDS AVAILABLE.—June, 1924, to April, 1929, when station was discontinued.

EXTREMES.—Maximum discharge during year, about 3,060 second-feet Apr. 8 (gage height, 10.90 feet); minimum, 4.4 second-feet Nov. 11 and 12 (gage height, 2.06 feet).

1924–1929: Maximum discharge by slope-area method, 23,800 second-feet Apr. 21, 1926 (gage height, 28.5 feet); minimum, that of Nov. 11 and 12, 1928.

REMARKS.—Records for low and intermediate stages fair and for high stages poor. No diversions above station. Discharge estimated Apr. 28–30.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
1	9.2	8.4	19	5.4	11	13	6.4
2	9.2	8.4	18	4.9	12	13	6.1
3	9.6	8.4	17	5.4	11	14	5.8
4	9.6	8.4	18	6.1	11	14	6.1
5	9.6	491	19	292	10	14	6.4
6	9.2	1,160	23	54	12	13	5.8
7	9.2	214	17	22	12	14	6.1
8	9.2	20	20	14	12	12	1,020
9	8.8	10	14	12	11	12	1,270
10	9.6	6.4	22	10	11	14	182
11	9.2	4.6	372	8.4	11	22	58
12	9.6	4.4	108	8.4	13	14	14
13	10	5.8	22	8.4	13	16	12
14	10	6.8	12	9.2	13	18	70
15	10	7.4	10	8.4	12	18	12
16	10	7.7	8.8	8.4	12	17	13
17	105	8.1	9.6	12	12	16	12
18	45	7.7	9.6	10	13	15	13
19	16	9.6	6.1	8.4	13	11	14
20	12	11	5.8	10	12	9.6	13
21	9.6	11	6.1	8.4	13	22	14
22	22	11	10	9.2	12	95	13
23	8.1	12	9.2	10	13	20	12
24	9.6	12	4.9	12	12	18	13
25	8.8	13	6.1	12	12	14	13
26	9.2	15	8.8	12	12	10	14
27	9.6	15	5.4	12	12	8.4	12
28	11	15	4.9	13	13	8.4	13
29	12	16	4.9	11	-------	7.4	13
30	7.7	18	5.4	12	-------	8.4	13
31	8.1	-------	6.1	11	-------	7.4	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	105	7.7	14.4	885
November	1,160	4.4	71.5	4,250
December	372	4.9	26.5	1,630
January	292	4.9	20.6	1,270
February	13	10	12.0	666
March	95	7.4	16.4	1,010
April	1,270	5.8	95.9	5,710
The period	-------	-------	-------	15,400

Digitized by Google

NUECES RIVER BASIN

NUECES RIVER AT LAGUNA, TEX.

LOCATION.—Water-stage recorder 1 mile northwest of Laguna, Uvalde County.
DRAINAGE AREA.—764 square miles.
RECORDS AVAILABLE.—October, 1923, to September, 1929.
EXTREMES.—Maximum discharge for year, 21,200 second-feet May 28 (gage height, 13.25 feet); minimum, 16 second-feet May 11, Sept. 1, 3, and 4 (gage height, 1.65 feet).

1923–1929: Maximum discharge, 27,000 second-feet July 23, 1926 (gage height, 14.88 feet); minimum, 8.9 second-feet Sept. 9–11, 1924.

The floods of 1913 and Sept. 21, 1923, reached a stage of 26.5 feet, from floodmarks (discharge, 74,500 second-feet, by slope-area method). Floods in 1903 reached a slightly higher stage.

REMARKS.—Records for low stages fair and for high stages poor. No diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	49		39	31	30	26	24	302	44	76	16
2	22	46		39	31	30	26	23	248	44	69	17
3	22	46		39	30	30	26	24	220	474	66	16
4	22	46		37	30	30	24	23	390	352	62	16
5	23	46	37	37	28	30	24	23	202	210	56	17
6	24	46		37	30	30	24	22	159	159	52	19
7	24	46		35	30	30	23	22	143	132	49	18
8	25	46		33	30	30	46	20	124	117	44	17
9	25	46		33	30	30	35	19	113	109	42	17
10	26	46	37	31	30	30	31	17	106	102	39	17
11	26	46	37	31	31	31	30	16	102	99	37	17
12	26	46	37	31	31	30	28	84	95	92	37	17
13	26	46	37	31	31	35	28	66	99	86	35	17
14	26	44	37	30	33	30	28	40	89	86	33	17
15	26	44	37	30	31	30	26	30	86	82	31	17
16	177	44	37	30	31	30	26	33	82	76	28	106
17	266	44	37	30	33	30	26	35	76	69	26	120
18	120	44	37	30	33	30	26	31	69	64	25	86
19	86	42	35	30	31	30	26	28	72	62	24	56
20	72	42	35	30	31	30	28	28	69	56	23	44
21	66	40	35	30	31	30	31	28	72	92	23	39
22	62	40	35	30	31	30	31	30	66	92	20	39
23	59	39	35	31	33	30	31	31	62	82	19	37
24	59	39	35	31	31	30	30	39	59	72	18	33
25	56	37	35	31	31	28	30	67	56	66	22	31
26	54	37	35	33	33	28	30	355	54	66	20	37
27	52	37	35	33	31	28	28	124	52	64	19	35
28	52	37	35	33	31	30	28	3,570	46	143	19	31
29	49	37	37	33	-------	30	28	2,940	62	92	18	30
30	49		39	33	-------	28	26	756	49	86	18	28
31	49	-------	39	31	-------	26	-------	437	-------	79	17	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	266	22	54.6	3,360
November	49	37	42.8	2,550
December	-------	-------	36.5	2,240
January	39	30	32.6	2,000
February	33	28	31.0	1,720
March	35	26	29.8	1,830
April	46	23	28.3	1,680
May	3,570	16	290	17,800
June	390	46	114	6,780
July	474	44	111	6,820
August	76	17	34.4	2,120
September	120	16	33.6	2,000
The year	3,570	16	70.4	50,900

Digitized by Google

NUECES RIVER NEAR UVALDE, TEX.

LOCATION.—Water-stage recorder at Tom Nunn crossing, 6 miles south of Southern Pacific Railroad bridge and 9 miles west of Uvalde, Uvalde County.

DRAINAGE AREA.—1,930 square miles, large part of which is noncontributing at low stages, owing to water entering fault a few miles above gage.

RECORDS AVAILABLE.—October, 1927, to September, 1929.

EXTREMES.—Maximum discharge during year, about 14,500 second-feet May 29 (gage height, 8.34 feet); minimum not determined.

1927–1929: Maximum discharge, that of May 29, 1929; minimum not determined.

The river reached a stage of 26.4 feet during December, 1913.

REMARKS.—Records fair. No diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.0	1.7		2.6	1.7	1.2	1.1	0.6	113	3.5	3.0	1.4
2	3.0	.8		2.6	1.9	1.2	1.2	.6	40	3.5	3.0	1.4
3	3.0	.9		2.6	1.7	1.2	1.2	.7	16	1,030	2.8	1.4
4	2.8	.9		2.4	1.4	1.2	1.1	.7	14	124	2.8	1.4
5	3.0	.8		1.9	1.2	1.1	1.1	.7	26	14	2.6	1.4
6	3.0	1.1		1.9	1.2	1.1	1.1	.7	12	9.9	2.6	2.4
7	3.0	1.0		1.9	1.1	1.2	1.1	.7	11	9.9	2.6	1.7
8	2.8	.9		1.9	1.0	1.2	1.2	.7	9.0	9.0	2.6	1.7
9	2.6	1.0		1.4	.6	1.4	1.1	.7	9.0	8.4	2.4	1.7
10	2.6	1.2		1.2	.5	1.4	1.0	.7	8.4	7.4	2.4	1.7
11	2.1		1.6	1.2	.3	1.4	1.0	.7	7.9	6.2	2.1	1.7
12	1.9			1.2	.2	1.4	1.0	2.6	7.4	5.2	1.9	1.7
13	1.7			1.1	.2	1.9	1.1	11	7.4	4.6	1.9	1.7
14	1.2			1.1	.2	1.7	.9	1.0	6.2	4.6	1.9	1.7
15	1.2			.9	.2	1.7	1.0	.9	6.2	4.0	1.9	1.7
16	1.7			.8	.2	1.7	1.1	.8	5.7	4.0	1.9	145
17	1.2			.7	.2	1.7	1.1	.8	5.2	4.0	1.7	3.5
18	1.2			.9	.2	1.7	1.0	.8	4.6	3.5	1.7	3.3
19	1.4			1.1	.2	1.9	.9	.7	4.6	3.5	1.4	3.3
20	1.2			1.1	.2	1.9	.8	.6	4.6	3.5	1.4	3.0
21	1.1	1.6		1.1	.2	1.9	.8	.6	4.0	3.3	1.4	3.0
22	1.4		2.1	1.2	.2	1.7	.8	.6	4.6	3.3	1.4	2.8
23	1.2		2.4	1.2	.3	1.7	.8	.6	4.6	3.5	1.4	2.6
24	1.1		2.4	1.2	.4	1.7	.9	.7	4.0	3.5	1.4	2.1
25	1.0		2.6	1.2	.5	1.7	.7	.4	4.6	3.5	1.4	2.1
26	1.0		2.1	1.4	.7	1.9	.6	.7	4.0	3.5	1.4	1.9
27	1.0		2.1	1.4	1.0	1.7	.7	.5	3.5	3.5	1.4	1.9
28	1.0		2.6	1.4	1.1	1.7	.6	.5	3.5	4.6	1.4	1.9
29	1.0		2.6	1.7	-------	1.7	.6	4,750	4.6	3.3	1.4	2.1
30	1.0		2.6	1.7	-------	1.4	.6	732	3.5	3.3	1.4	1.9
31	1.2	-------	2.4	1.4	-------	1.4	-------	273	-------	3.3	1.4	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	3	1.0	1.79	110
November	----------	----------	1.41	84
December	----------	----------	1.85	114
January	2.6	.7	1.46	90
February	1.9	.2	.67	37
March	1.9	1.1	1.54	95
April	1.2	.6	.94	56
May	4,750	.4	187	11,500
June	113	3.5	12.0	714
July	1,030	3.3	42.0	2,580
August	3.0	1.4	1.94	119
September	145	1.4	6.84	407
The year	4,750	----------	21.9	15,900

Digitized by Google

NUECES RIVER AT COTULLA, TEX.

LOCATION.—Staff gage 100 feet upstream from Farmer Dam, half a mile below International-Great Northern Railroad bridge, and 1.9 miles by road from post office at Cotulla, LaSalle County.

DRAINAGE AREA.—5,260 square miles, large part of which is noncontributing at low stages, owing to water entering a fault near Uvalde.

RECORDS AVAILABLE.—October, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, 22,100 second-feet May 29 (gage height, 12.20 feet); no flow during several periods.

1923–1929: Maximum discharge, 49,500 second-feet June 3, 1925 (gage height, 14.89 feet); no flow during several periods.

REMARKS.—Records fair. Most of low-water flow is diverted by pumping from storage reservoir above; amount not known. Low-water flow is regulated by storage reservoir above.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	948	0	5.2	0	1,700	0	182	0
2	240	0	3.1	0	1,530	0	680	0
3	143	0	2.5	0	1,530	0	860	0
4	116	0	1.9	0	1,280	0	655	0
5	68	0	1.3	0	718	0	159	0
6	46	0	.7	0	186	0	130	0
7	24	0	.3	0	136	0	89	0
8	12	0	201	0	89	10	60	0
9	7.0	0	542	0	28	420	42	0
10	5.2	0	82	0	13	480	26	0
11	3.1	0	17	0	8.2	300	8.8	0
12	1.9	0		0	6.4	159	3.7	0
13	.9	0	100	0	4.6	89	1.3	0
14	.5	0		2.3	3.4	68	.7	0
15	.1	0	420	571	1.9	28	0	0
16	0	0	480	948	1.6	15	0	0
17	0	0	195	836	1.0	12	0	0
18	0	0	109	580	.8	11	0	0
19	0	0		2,220	.6	10	0	550
20	0	0		1,790	.2	7.6	0	788
21	0	151	220	730	0	7.0	0	3,240
22	0	360		222	0	5.8	0	13,200
23	0	300		102	0	4.6	0	15,300
24	0	642	336	788	0	3.7	0	11,000
25	0	817	186	817	0	3.1	0	5,930
26	0	518	68	7,950	0	2.5	0	2,290
27	0	159	31	12,000	0	1.0	0	759
28	0	64	16	12,800	0	0	0	240
29	0	31	7.6	15,200	0	0	0	231
30	0	8.8	1.6	5,920	0	0	0	73
31	0	6.4	-------	2,580	---------	0	0	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	948	0	52.1	3,200
March	817	0	98.6	6,060
April	----------	0.3	137	8,150
May	15,200	0	2,130	131,000
June	1,700	0	241	14,300
July	480	0	52.8	3,250
August	860	0	93.4	5,740
September	15,300	0	1,790	107,000
The year	15,300	0	384	279,000

NOTE.—No flow November to February.

Digitized by Google

NUECES RIVER NEAR THREE RIVERS, TEX.

LOCATION.—Staff gage at San Antonio, Uvalde & Gulf Railroad bridge 2 miles southeast of Three Rivers, Live Oak County, and half a mile below Frio River.

DRAINAGE AREA.—15,600 square miles, part of which is noncontributing at low stages, owing to water entering faults near Uvalde.

RECORDS AVAILABLE.—July, 1915, to September, 1929.

EXTREMES.—Maximum discharge during year, about 29,000 second-feet May 31 (gage height, 41.7 feet); no flow Nov. 2–4, and Sept. 10.

1915–1929: Maximum discharge not determined (gage height, 46.0 feet, probably some backwater, owing to Gulf storm, Sept. 18, 1919); no flow during several periods.

REMARKS.—Records fair. About 10,000 acres has been declared irrigated above station. At very low stages flow is regulated for short periods by railway pumping plant just above control. Gage-height record furnished by United States Weather Bureau.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	790	0.6	2.4	10	2.4	2.4	282	137	27,400	395	14	1.3
2	940	0	2.4	6.5	2.4	1.3	137	60	24,400	195	10	1.3
3	1,000	0	1.3	4.0	4.0	1.3	75	48	21,600	497	10	.6
4	1,090	0	1.3	116	4.0	1.3	38	38	18,200	685	6.5	.6
5	1,240	254	2.4	1,630	4.0	2.4	31	31	13,800	379	6.5	.6
6	1,540	2,170	2.4	429	6.5	2.4	25	25	9,680	724	4.0	1.3
7	2,020	1,540	31	108	4.0	2.4	19	19	7,120	2,140	22	1.3
8	2,410	205	25	31	4.0	2.4	838	10	5,060	1,840	316	.6
9	2,470	60	14	25	4.0	2.4	4,040	6.5	3,760	1,600	331	.6
10	1,500	31	46	19	4.0	1.3	3,100	4.0	3,140	1,180	195	0
11	117	25	880	14	4.0	2.4	1,600	4.0	2,920	470	117	4.0
12	60	14	470	10	2.4	103	1,270	2.4	1,900	299	75	48
13	38	10	264	6.5	2.4	38	1,300	26.0	433	195	38	60
14	31	6.5	48	6.5	4.0	19	2,860	282	265	299	25	48
15	19	6.5	31	6.5	4.0	10	2,890	363	214	395	19	25
16	14	4.0	19	4.0	4.0	6.5	2,170	470	137	299	14	25
17	25	4.0	14	4.0	2.4	4.0	1,960	1,420	137	195	6.5	31
18	19	4.0	10	6.5	2.4	4.0	1,300	4,260	117	137	4.0	167
19	38	4.0	6.5	6.5	2.4	125	660	3,520	95	95	2.4	510
20	19	4.0	232	4.0	2.4	1,840	450	2,830	75	60	6.5	735
21	10	2.4	315	4.0	2.4	6,560	395	2,260	48	38	22	535
22	6.5	2.4	137	4.0	4.0	10,500	331	2,140	137	31	195	117
23	6.5	1.3	48	6.5	2.4	8,830	1,060	2,260	95	25	48	60
24	137	.6	31	6.5	2.4	4,550	331	3,100	75	25	19	48
25	31	.6	75	4.0	2.4	1,960	265	4,290	48	57	19	214
26	14	2.4	60	4.0	2.4	1,030	157	5,760	48	395	25	430
27	10	2.4	48	4.0	2.4	1,030	231	9,440	38	248	95	610
28	2.4	2.4	31	4.0	2.4	1,330	282	10,800	48	60	14	850
29	1.3	2.4	19	4.0	------	1,480	315	12,300	75	31	4.0	1,390
30	.6	2.4	14	4.0	------	1,390	231	19,600	322	25	2.4	2,890
31	.6	------	10	4.0	------	660	------	28,100	------	25	1.3	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2,470	0.6	503	30,900
November	2,170	0	145	8,630
December	880	1.3	93.2	5,730
January	1,630	4.0	80.5	4,950
February	6.5	2.4	3.23	179
March	10,500	1.3	1,340	82,400
April	4,040	19	955	56,800
May	28,100	2.4	3,660	225,000
June	27,400	38	4,710	280,000
July	2,140	25	421	25,900
August	331	1.3	53.8	3,310
September	2,890	0	294	17,500
The year	28,100	0	1,020	741,000

Digitized by Google

NUECES RIVER AT CALALLEN, TEX.

LOCATION.—Staff gage at old pump house for city of Corpus Christi half a mile northwest of Calallen, Nueces County, and half a mile above edge of tidewater and breakwater dam.

DRAINAGE AREA.—16,900 square miles, large part of which is noncontributing at low stages, owing to water entering faults near Uvalde.

RECORDS AVAILABLE.—August, 1915, to September, 1929.

EXTREMES.—Maximum stage during year, 10.65 feet June 5 and 6; minimum stage, −0.35 foot Mar. 16.

1915–1929: During September, 1919, the river reached a stage of about 12 feet, as determined from floodmarks on gage. This was not only the highest stage reached during the period covered by records but probably exceeds any that occurred for many years prior to the establishment of this station. No flow Aug. 23–28, 1918.

REMARKS.—Discharge not computed. Gage-height record furnished by city of Corpus Christi.

Daily gage height, in feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.22	0.50	0.70	1.48	0.08	0.48	3.88	2.35	8.60	2.45	2.00	2.42
2	3.42	.50	.65	1.40	.05	.48	3.60	2.20	8.92	2.58	1.88	2.32
3	3.62	.50	.62	1.35	.10	.70	3.18	1.95	9.18	3.05	1.80	2.18
4	3.70	.58	.60	1.40	.20	.95	2.68	1.80	10.08	3.22	1.78	2.15
5	3.78	.82	.60	1.88	.25	.75	2.28	1.72	10.62	3.18	1.70	2.15
6	4.08	3.02	.60	4.45	.22	.55	2.00	1.55	10.62	3.35	1.65	2.15
7	4.22	4.98	.60	4.75	.25	.35	1.88	1.45	10.52	3.40	1.65	2.15
8	4.38	5.70	.60	4.02	.28	.15	1.72	1.38	10.35	3.45	1.60	2.12
9	4.58	5.98	.60	3.42	.38	.10	1.75	1.30	10.15	3.90	1.50	2.10
10	5.15	3.80	.70	2.70	.45	.22	2.15	1.30	9.85	4.30	1.60	2.10
11	5.40	2.15	.95	2.12	.42	.40	4.60	1.50	9.48	4.22	2.60	2.08
12	5.35	1.75	.95	1.78	.32	.50	5.52	1.60	8.90	4.15	2.52	2.10
13	2.88	1.55	1.42	1.48	.25	.55	5.72	1.68	8.25	3.80	2.30	2.15
14	2.05	1.42	2.78	1.38	.18	.35	4.75	2.05	7.54	3.28	2.25	2.05
15	1.78	1.35	2.52	1.30	.15	−.05	4.45	2.05	6.20	2.80	2.38	2.00
16	1.65	1.28	2.15	1.25	.18	−.30	5.22	2.55	3.95	2.62	2.55	2.00
17	1.60	1.25	1.88	1.15	.25	.20	5.92	2.90	2.95	2.78	2.55	2.00
18	1.48	1.20	1.68	1.10	.35	.62	6.00	3.05	2.60	2.75	2.50	1.90
19	1.40	1.20	1.50	1.02	.30	.85	5.48	3.62	2.58	2.60	2.50	1.80
20	1.30	1.18	2.15	1.00	.30	1.30	4.60	4.75	2.48	2.45	2.72	1.78
21	1.42	1.05	2.82	.98	.30	2.58	3.40	5.42	2.40	2.28	2.72	1.58
22	1.72	1.00	2.30	.92	.22	4.70	3.08	5.92	2.38	2.12	2.80	1.42
23	1.52	1.00	2.50	.88	.12	5.25	2.88	5.88	2.35	2.05	2.82	1.40
24	1.30	.92	2.40	.85	.25	6.15	2.75	5.35	2.48	2.00	2.88	1.22
25	1.22	.88	2.08	.78	.45	6.90	2.90	5.02	2.38	1.98	3.02	1.32
26	1.10	.72	1.82	.65	.42	7.58	2.78	5.50	2.32	1.92	3.10	1.48
27	1.00	.70	1.62	.52	.50	8.12	2.58	6.08	2.18	3.08	3.00	1.68
28	.90	.70	1.65	.42	.48	7.75	2.40	6.52	2.18	3.22	2.80	1.60
29	.78	.70	1.65	.32	.....	6.40	2.22	7.20	2.32	2.80	2.72	1.40
30	.68	.70	1.60	.25	.....	4.70	2.32	7.62	2.32	2.50	2.62	1.40
31	.58	.....	1.52	.15	.....	3.92	.....	8.05	.....	2.20	2.52	.....

Digitized by Google

FRIO RIVER AT CONCAN, TEX.

LOCATION.—Staff and chain gages half a mile below Concan post office, Uvalde County, four-fifths of a mile below what is known as "Shut In."
DRAINAGE AREA.—485 square miles.
RECORDS AVAILABLE.—October, 1923, to September, 1929.
EXTREMES.—Maximum discharge during year, 2,000 second-feet May 29 and July 3 (gage height, 4.50 feet); minimum, 13 second-feet Aug. 29–31.
1923–1929: Maximum discharge, about 30,400 second-feet July 13, 1926 (gage height, 14.50 feet); minimum, 8.1 second-feet Aug. 2 and 3, 1928.
Highest known stage, 28.8 feet (from floodmark) Sept. 18, 1923.
REMARKS.—Monthly records fair. Daily records not sufficiently accurate for publication. No diversions above station.

Monthly discharge, in second-feet, 1928–29

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	223	23	35.9	2,210
November	24	24	24.0	1,430
December	25	24	24.2	1,490
January	25	23	24.2	1,490
February	22	20	20.8	1,160
March	20	20	20.0	1,230
April	20	14	16.6	988
May	934	13	66.9	4,110
June	----------	33	46.2	2,750
July	943	28	65.2	4,010
August	28	13	19.2	1,180
September	29	19	23.2	1,380
The year	943	13	32.4	23,400

Digitized by Google

FRIO RIVER NEAR DERBY, TEX.

LOCATION.—Staff gage at International-Great Northern Railroad bridge 900 feet below mouth of Leona River and 4 miles south of Derby, Frio County.

DRAINAGE AREA.—3,490 square miles, large part of which is noncontributing at low stages, owing to water entering fault near Uvalde.

RECORDS AVAILABLE.—August, 1915, to September, 1929.

EXTREMES.—Maximum discharge during year, 7,200 second-feet May 26 (gage height, 9.80 feet); no flow during several periods.

1915–1929: Maximum discharge, about 34,400 second-feet Sept. 18, 1919 (gage height, 19.5 feet); no flow during several periods of each year.

REMARKS.—Records good. Small areas are irrigated above station; amount diverted not known.

Daily and monthly discharge, in second-feet, 1928–29

Day	Apr.	May	June	July	Sept.	Day	Apr.	May	June	July	Sept.
1	0	0	467	0	0	16	23	490	0.2	0.6	0
2	0	0	232	0	0	17	11	190	.2	.3	0
3	0	0	91	0	0	18	4.7	602	.2	.2	0
4	0	0	33	345	0	19	1.7	2,190	.2	.2	0
5	0	0	17	1,940	0	20	.5	1,050	.2	.2	18
6	0	0	8.4	465	0	21	0	262	.2	.2	11
7	0	0	3.0	175	0	22	5.7	46	.2	0	4.1
8	0	0	1.7	106	0	23	170	16	.2	0	.1
9	0	0	1.4	47	0	24	35	483	.2	0	0
10	0	0	1.4	22	0	25	13	763	.2	0	0
11	0	0	.6	8.4	0	26	3.0	5,450	.2	0	0
12	0	0	.5	3.0	0	27	0	5,200	0	0	0
13	0	37	.3	2.1	0	28	0	1,350	0	0	0
14	564	1,070	.2	.6	0	29	0	192	0	0	0
15	128	1,940	.2	.6	0	30	0	1,460	0	0	0
						31	-------	1,050	-------	0	0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April	564	0	32.0	1,900
May	5,450	0	769	47,300
June	467	0	28.7	1,710
July	1,940	0	101	6,210
September	18	0	1.11	66
The year	5,450	0	78.9	57,200

NOTE.—No flow October to March and August.

LEONA RIVER NEAR DIVOT, TEX.

LOCATION.—Staff gage at Divot-Pearsall highway bridge 2½ miles northeast of Divot, Frio County, and 12 miles above mouth of river.

DRAINAGE AREA.—565 square miles.

RECORDS AVAILABLE.—April, 1924, to September, 1929.

EXTREMES.—Maximum discharge during year, about 6,130 second-feet May 26 (gage height, 15.50 feet); no flow during most of year.

1924–1929: Maximum discharge, that of May 26, 1929; no flow during several periods each year.

REMARKS.—Monthly records fair. Records of daily discharge not sufficiently accurate for publication. Several small diversions above station; amount not known. Low-water flow regulated by dams upstream.

Month	Maximum	Minimum	Mean	Run-off in acre-feet
May	4,110	0	267	17,000
June	5.2	0	.17	10
September	193	0	17.0	1,000
The period	----------	----------	----------	18,000

NOTE.—No record Oct. 1 to Mar. 31. No flow during April, July, and August.

Digitized by Google

RIO GRANDE BASIN

RIO GRANDE AT SAN MARCIAL, N. MEX.

LOCATION.—Water-stage recorder in sec. 17, T. 7 S. R. 1 W., at highway bridge half a mile northeast of San Marcial, Socorro County.

DRAINAGE AREA.—30,000 square miles.

RECORDS AVAILABLE.—January, 1922, to September, 1929. From January, 1895, to December, 1921, a station was maintained 1½ miles downstream.

EXTREMES.—Maximum discharge not determined (gage height, 7.40 feet Sept. 24); no flow Oct. 1 to Nov. 18.

1895–1929: Maximum mean daily discharge, 33,000 second-feet Oct. 11, 1904 (maximum discharge on Sept. 24, 1929, probably reached about the same discharge as the flood of 1904); no flow during several periods.

REMARKS.—Records fair except those for short periods of ice effect in winter, which are poor. Water diverted from Rio Grande and tributaries above station for irrigation of 600,000 acres.

Daily and monthly discharge, in second-feet, 1928–29

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	354	479	584	606	920	1,500	4,480	127	1,250	3,600
2	0	385	435	575	556	1,460	1,520	4,030	96	784	3,620
3	0	370	555	507	585	1,200	2,120	3,990	388	1,490	2,560
4	0	377	497	488	575	1,080	1,960	3,680	114	2,240	2,270
5	0	354	409	479	596	1,100	1,640	3,390	267	1,670	3,180
6	0	295	393	479	596	1,040	1,620	3,550	86	1,050	3,240
7	0	295	330	555	489	1,220	1,920	3,480		649	2,610
8	0	243	444	507	395	1,880	2,710	3,520	2.0	4,860	1,860
9	0	274	536	605	373	1,860	3,010	3,390		5,830	1,220
10	0	354	435	440	335	1,500	3,480	3,270		11,900	1,330
11	0	722	393	280	294	1,350	4,560	3,390	127	10,800	1,500
12	0	546	479	122	883	1,280	5,260	3,550	547	15,100	1,600
13	0	377	565	270	883	1,070	5,520	3,300	832	16,300	1,580
14	0	444	507	410	933	870	5,090	2,840	920	14,200	1,410
15	0	427	488	560	895	703	3,960	2,810	280	8,240	1,400
16	0	435	427	700	820	596	3,610	2,460	123	5,970	1,140
17	0		444	689	659	691	3,920	2,190	53	5,130	1,270
18	0		435	733	627	726	4,640	1,810	24	3,640	1,520
19	7.8		418	679	627	883	4,960	1,400	118	3,270	1,550
20	47		393	810	617	1,220	5,390	1,140	254	3,010	1,590
21	86		479	755	508	1,620	5,920	960	82	2,710	1,980
22	135	400	497	636	472	2,100	6,340	691	327	2,100	6,490
23	162		400	565	412	1,680	7,440	566	472	1,710	12,200
24	192		200	575	403	1,530	8,240	508	703	1,320	
25	219		80	453	480	1,450	7,700	463	1,640	1,220	20,000
26	208		250	435	784	1,810	6,580	429	2,810	1,880	
27	248		350	462	1,220	1,840	6,580	380	1,020	1,690	
28	237	844	471	575	1,770	1,790	5,790	294	1,840	1,790	5,700
29	346	890	462	------	1,360	1,660	5,790	214	2,950	1,940	4,880
30	316	925	507	------	1,040	1,620	5,560	177	1,660	1,800	4,060
31	------	700	605	------	920	------	5,010	------	1,320	2,950	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
November	346	0	73.4	4,340
December	925	243	452	27,800
January	605	80	431	26,500
February	810	122	533	29,600
March	1,770	294	700	43,000
April	2,100	596	1,320	78,600
May	8,240	1,500	4,490	276,000
June	4,480	177	2,210	132,000
July	2,950	----------	619	38,100
August	16,300	649	4,470	275,000
September	----------	1,140	5,180	308,000
The year	----------	0	1,710	1,240,000

NOTE.—No flow during October.

Digitized by Google

RIO GRANDE BELOW ELEPHANT BUTTE DAM, N. MEX.

LOCATION.—Water-stage recorder in sec. 25, T. 13 S., R. 4 W., just below Elephant Butte Dam, Sierra County. Mescal Canyon enters river half a mile downstream.

RECORDS AVAILABLE.—October, 1916, to September, 1929.

EXTREMES.—No data.

REMARKS.—Records good. Considerable water is diverted above station; amount not known. Flow controlled by Elephant Butte Dam which forms reservoir having capacity of 2,638,000 acre-feet. Records furnished by United States Bureau of Reclamation. Computations changed slightly to conform with rules used by United States Geological Survey.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	820	3	3	3	3	694	1,740	1,880	1,430	1,830	1,550	1,740
2	820	3	53	3	3	825	1,850	1,710	1,540	1,460	1,590	1,740
3	800	3	525	3	3	825	1,850	1,740	1,750	1,680	1,700	1,690
4	800	3	525	3	221	825	1,900	1,610	1,770	1,980	1,640	1,370
5	800	3	520	3	700	825	2,030	1,610	1,720	1,980	1,700	1,440
6	800	3	430	3	586	825	1,660	1,610	1,720	1,980	1,640	1,600
7	800	3	430	3	493	825	2,030	1,610	1,730	1,980	1,640	1,600
8	800	3	382	3	493	825	2,040	1,610	1,920	1,960	1,540	1,600
9	760	3	125	3	493	840	2,270	1,620	1,910	1,960	1,400	1,570
10	90	3	125	3	493	891	2,250	1,880	1,900	1,940	1,150	1,300
11	3	3	35	3	493	891	2,150	1,880	1,960	1,640	1,040	1,300
12	3	540	3	6	493	891	2,260	1,940	2,050	1,430	790	1,180
13	3	540	3	406	493	901	2,270	2,160	2,100	1,480	675	1,120
14	3	450	3	406	493	932	2,310	2,160	2,180	1,580	675	1,120
15	3	450	3	406	493	932	2,310	2,000	2,290	1,580	675	1,120
16	3	450	3	406	530	940	2,300	1,820	2,290	1,580	675	1,100
17	3	450	3	406	676	1,140	2,120	1,700	2,290	1,580	740	1,040
18	3	450	3	406	676	1,080	2,100	1,720	2,200	1,580	920	1,030
19	25	450	3	406	676	1,080	1,960	1,720	2,020	1,560	935	973
20	540	427	3	406	676	1,080	2,000	1,740	2,040	1,400	1,090	966
21	540	3	3	406	650	1,080	2,030	1,680	2,040	1,240	1,090	832
22	540	3	3	406	576	1,120	2,030	1,500	2,040	1,240	1,110	832
23	540	3	3	329	582	1,240	2,050	944	2,040	1,400	1,280	810
24	540	3	3	3	694	1,240	1,970	965	2,040	1,640	1,280	574
25	540	3	3	3	694	1,240	1,970	1,320	2,040	1,790	1,280	574
26	540	3	3	3	694	1,240	1,970	1,330	2,040	1,790	1,400	574
27	540	3	3	3	694	1,240	1,970	1,330	2,040	1,750	1,700	574
28	540	3	3	3	694	1,240	1,970	1,160	2,040	1,730	1,700	574
29	540	3	3	3	.....	1,250	1,970	1,020	2,020	1,580	1,700	573
30	540	3	3	3	.....	1,660	1,970	1,100	1,860	1,540	1,700	443
31	225	.....	8	3	.....	1,660	.....	1,360	.....	1,540	1,700	.....

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	820	3	436	26,800
November	540	3	142	8,450
December	525	3	104	6,400
January	406	3	144	8,850
February	700	3	517	28,700
March	1,660	694	1,040	64,000
April	2,310	1,660	2,040	121,000
May	2,160	944	1,590	97,800
June	2,290	1,430	1,970	117,000
July	1,980	1,240	1,660	102,000
August	1,700	675	1,280	78,700
September	1,740	443	1,100	65,500
The year	2,310	3	1,000	725,000

Digitized by Google

RIO GRANDE NEAR EL PASO, TEX.

LOCATION.—Water-stage recorder in SE. ¼ sec. 9, T. 29 S., R. 4 E., at Courchenes quarries 4 miles northwest of El Paso, El Paso County.

RECORDS AVAILABLE.—May, 1897, to September, 1929. May, 1889, to June, 1893, for station at Old Fort Bliss 1,500 feet above Mexican Dam; January, 1895, to May, 1897, for station at pumping house of smelter company, 1 mile below present gage.

EXTREMES.—Maximum discharge during year, 6,870 second-feet Aug. 11 (gage height, 6.18 feet); minimum, 128 second-feet Feb. 7 (gage height, 0.46 foot). 1889–1893, 1895–1929: Maximum mean daily discharge, 23,700 second-feet June 12, 1905; no flow for several periods previous to construction of Elephant Butte Dam.

REMARKS.—Records good. Considerable water is diverted above station; amount not known. Flow regulated by Elephant Butte Reservoir, diversions, and return water from irrigated lands between reservoir and gaging station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	790	986	230	170	158	468	902	1,090	531	1,130	3,190	1,050
2	689	726	212	170	154	486	862	1,180	584	1,000	1,390	1,130
3	661	619	190	170	146	537	814	1,180	806	902	1,010	953
4	612	486	190	162	146	531	782	1,040	703	910	1,120	1,030
5	605	352	195	158	142	584	750	1,070	726	846	1,520	1,030
6	591	299	204	158	142	584	782	1,010	838	1,080	1,440	863
7	570	283	259	158	139	524	977	862	782	1,080	1,310	760
8	524	273	380	162	150	474	854	798	822	1,180	2,000	953
9	499	254	402	150	363	468	830	766	918	1,120	1,630	1,080
10	512	244	397	154	420	518	902	814	1,010	1,350	2,580	934
11	474	240	368	139	391	524	968	750	959	3,780	5,830	944
12	1,000	240	352	135	374	537	1,000	910	846	2,320	3,250	925
13	1,090	226	283	132	325	518	1,000	1,220	806	1,760	3,560	889
14	640	259	240	128	309	505	1,200	1,030	862	1,470	2,990	880
15	480	288	235	146	336	544	1,400	1,260	959	1,440	2,160	872
16	391	352	226	142	358	505	1,230	1,490	1,080	1,110	1,360	793
17	374	449	208	146	336	563	1,320	1,650	1,390	1,110	1,110	760
18	336	443	208	244	346	661	1,350	1,450	1,200	968	1,040	742
19	341	462	226	309	363	734	1,130	1,300	1,080	862	962	784
20	320	431	208	304	325	682	1,190	1,380	1,140	977	989	750
21	283	449	195	309	443	654	1,090	1,280	1,080	1,430	810	709
22	278	462	182	320	455	668	1,120	1,560	1,050	1,310	1,070	979
23	268	402	186	352	443	647	1,160	2,530	1,130	1,160	1,150	1,410
24	391	304	186	391	505	675	1,080	1,980	1,130	846	2,840	1,020
25	455	330	182	414	499	742	1,070	1,100	977	774	1,610	810
26	426	325	182	414	420	579	1,040	902	977	870	1,210	684
27	426	283	182	304	426	626	1,100	902	986	1,280	968	629
28	455	283	178	226	462	742	1,260	878	977	1,170	856	519
29	455	268	174	174	.....	846	1,310	758	959	1,760	692	462
30	468	244	170	170	.....	703	1,090	710	1,020	2,790	1,270	644
31	598	.....	166	158	.....	870	.....	689	.....	1,950	980	.....

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,090	268	516	31,700
November	986	226	375	22,300
December	402	166	232	14,300
January	414	128	215	13,200
February	505	139	324	18,000
March	870	468	603	37,100
April	1,400	750	1,050	62,500
May	2,530	689	1,150	70,700
June	1,390	531	944	56,200
July	3,780	774	1,350	83,000
August	5,830	692	1,740	107,000
September	1,410	462	866	51,500
The year	5,830	128	783	568,000

Digitized by Google

RIO GRANDE AT TORNILLO BRIDGE, NEAR FABENS, TEX.

LOCATION.—Water-stage recorder in NE. ¼ NW. ¼ sec. 26, T. 34 S., R. 8 E., at highway bridge 4½ miles southeast of Fabens, El Paso County.

RECORDS AVAILABLE.—October, 1927, to September, 1929. Station maintained for several years prior to October, 1927, by United States Bureau of Reclamation.

EXTREMES.—Maximum discharge during year, 3,440 second-feet Aug. 14 (gage height, 14.72 feet); no flow at 12.15 p. m., June 14.

1927–1929: Maximum discharge, that of Aug. 14, 1929; no flow at 12.15 p. m., June 14, 1929.

REMARKS.—Records fair. Considerable water is diverted above station; amount not known. Flow regulated by Elephant Butte Reservoir, diversions, and return water from irrigated lands between reservoir and gaging station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	453	414	227	137	109	50	204	319	184	201	1,160	153
2	241	637	215	113	128	54	150	284	71	193	1,250	241
3	190	505	190	130	142	65	34	340	58	61	1,300	228
4	193	475	187	135	135	71	28	322	9	16	725	70
5	139	357	198	119	135	23	17	368	6	77	432	91
6	135	305	174	111	135	52	10	344	2	9	425	130
7	116	235	101	122	86	103	7	175	39	30	321	59
8	151	195	109	133	35	62	56	51	7	38	418	82
9	97	182	190	133	23	45	66	20	86	25	891	214
10	103	171	256	135	34	12	22	24	84	265	970	224
11	142	161	241	135	146	49	18	36	19	457	1,250	220
12	144	209	195	133	71	24	22	50	10	827	1,600	302
13	638	253	177	130	51	44	65	169	7	1,020	2,340	246
14	659	256	182	130	18	11	137	262	1	1,260	3,380	159
15	337	250	159	130	9	14	277	151	2	930	3,220	175
16	299	268	109	122	10	25	303	363	95	486	2,740	215
17	296	262	169	130	23	54	303	577	201	265	1,770	193
18	305	327	244	115	23	144	343	721	274	144	858	154
19	293	318	156	122	11	101	299	637	184	71	525	117
20	305	299	161	169	27	140	192	471	164	60	293	103
21	327	290	164	177	8	159	390	633	122	302	334	117
22	268	293	154	169	13	116	268	633	61	494	365	107
23	130	290	166	142	62	121	130	935	88	337	504	251
24	107	277	174	154	107	168	119	1,080	201	190	597	527
25	135	204	171	135	84	131	71	1,280	151	82	970	327
26	107	117	169	196	44	80	138	1,060	115	33	738	156
27	72	235	142	174	59	35	175	573	67	56	385	143
28	81	241	156	115	56	51	371	401	33	418	96	102
29	95	235	156	82	------	79	498	256	19	471	30	39
30	154	220	154	40	------	163	465	159	204	863	5	28
31	302	------	147	139	------	106	------	139	------	1,050	164	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	659	72	226	13,900
November	637	117	283	16,800
December	256	101	174	10,700
January	198	40	133	8,180
February	146	8	63.7	3,540
March	168	11	75.9	4,670
April	498	7	172	10,200
May	1,280	20	414	25,500
June	274	1	85.5	5,090
July	1,290	9	347	21,300
August	3,380	5	970	59,600
September	527	28	173	10,300
The year	3,380	1	262	190,000

Digitized by Google

RIO GRANDE BELOW OLD FORT QUITMAN, NEAR FINLAY, TEX.

LOCATION.—Water-stage recorder at lower end of El Paso Valley 1½ miles below Old Fort Quitman and 11½ miles south of Finlay, Hudspeth County. Zero of gage, 3,452.64 feet (revised) above mean sea level.

RECORDS AVAILABLE.—January, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, 2,460 second-feet Aug. 20 (gage height, 6.38 feet); minimum, 40 second-feet Apr. 14 (gage height, 0.32 foot).

1923–1929: Maximum mean daily discharge, 2,600 second-feet Sept. 11, 1925; minimum, 20 second-feet July 23 and 24, 1925.

REMARKS.—Records good. Considerable water diverted above station; amount not known. Flow regulated by storage at Elephant Butte Reservoir, diversions, and return water from irrigated lands between reservoir and gaging station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	842	428	237	170	142	147	149	300	250	126	766	240
2	748	408	235	176	123	130	195	278	220	225	860	258
3	522	408	230	176	151	161	140	225	218	230	910	274
4	421	582	220	155	138	168	160	202	176	183	965	317
5	388	637	213	157	162	178	133	225	126	151	960	305
6	372	641	213	162	159	170	84	215	96	138	598	228
7	329	561	211	160	155	155	65	262	81	142	476	192
8	295	456	250	146	151	123	59	273	94	110	536	199
9	278	378	247	146	164	113	52	202	128	88	510	199
10	303	314	220	151	159	140	57	137	123	98	1,280	178
11	260	281	267	153	140	151	73	88	116	81	1,160	192
12	254	265	353	159	137	153	59	66	113	118	1,210	240
13	292	267	388	157	223	137	44	76	73	180	1,270	244
14	356	250	344	157	265	137	43	68	75	435	1,390	254
15	654	244	323	155	227	128	57	75	73	518	1,350	278
16	557	237	326	151	187	159	58	170	90	620	1,450	248
17	496	240	303	155	144	170	105	185	103	488	1,650	262
18	418	252	273	144	119	172	168	223	106	257	1,830	314
19	341	252	198	138	123	116	170	341	111	162	2,120	286
20	317	311	225	144	144	106	191	459	131	123	2,410	252
21	300	369	202	144	131	126	250	518	119	114	1,540	226
22	295	372	191	170	130	116	198	456	106	131	742	268
23	286	350	193	218	151	239	237	1,030	116	289	644	234
24	329	353	189	235	138	220	232	916	100	295	692	266
25	297	350	185	235	138	198	131	708	96	273	705	317
26	260	338	187	213	153	209	113	802	119	206	925	462
27	314	314	187	193	176	176	114	950	124	142	900	417
28	317	237	180	215	140	126	121	629	102	237	559	278
29	297	211	170	240	-------	106	140	425	110	220	322	224
30	522	242	166	220	-------	98	211	332	110	385	292	226
31	452	-------	170	183	-------	110	-------	278	-------	500	262	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	842	254	391	24,000
November	641	211	352	20,900
December	388	166	235	14,400
January	240	138	173	10,600
February	265	119	156	8,660
March	239	98	150	9,220
April	250	43	127	7,560
May	1,030	66	358	22,000
June	250	73	120	7,140
July	620	81	234	14,400
August	2,410	262	1,010	62,100
September	462	178	263	15,600
The year	2,410	43	299	217,000

Digitized by Google

RIO GRANDE AT BOQUILLAS, TEX.

LOCATION.—Water-stage recorder 4.0 miles below mouth of Tornillo Creek and 73 miles southeast of Marathon, Brewster County.

RECORDS AVAILABLE.—June, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 27,600 second-feet Sept. 11 (gage height, 11.90 feet); minimum, 750 second-feet July 15 (gage height, 1.23 feet).

1928–29: Maximum discharge, that of Sept. 11, 1929; minimum, that of July 15, 1929.

REMARKS.—Records good. Considerable water is diverted above station. Amount not known. Flow partly regulated by Elephant Butte Dam and dams on tributaries. Discharge estimated Aug. 28.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,330	1,780	1,240	2,029	1,560	1,600	1,270	1,240	2,660	1,130	3,790	1,840
2	2,250	1,860	1,060	2,020	1,410	1,490	1,340	1,040	3,820	1,150	3,400	1,650
3	2,410	2,330	981	2,000	1,480	1,480	1,320	1,000	2,500	1,560	2,840	1,580
4	2,410	2,250	915	1,850	1,540	1,490	1,700	1,000	1,840	1,560	2,840	1,410
5	2,330	2,090	1,250	1,730	1,560	1,490	1,190	959	1,560	1,090	2,410	1,300
6	2,170	2,090	1,640	1,730	1,560	1,520	1,060	959	1,490	1,010	2,250	1,220
7	2,090	2,250	1,720	1,750	1,520	1,530	1,040	937	1,080	981	2,250	1,080
8	1,970	2,330	1,680	1,750	1,580	1,450	1,140	970	1,450	1,110	2,330	1,160
9	1,850	2,330	1,760	1,710	1,400	1,400	1,530	981	2,020	970	2,580	1,090
10	1,720	2,170	1,910	1,710	1,500	1,350	2,090	871	2,500	904	2,330	1,020
11	1,680	2,250	1,970	1,500	1,580	1,380	1,610	882	1,500	882	2,040	18,900
12	1,730	2,250	1,980	1,340	1,580	1,420	1,320	871	1,250	871	2,250	3,890
13	1,570	2,170	1,070	1,420	1,580	1,410	1,270	970	1,130	849	2,410	2,250
14	1,490	2,170	1,960	1,500	1,600	1,360	1,210	915	1,050	860	2,500	2,000
15	1,520	2,090	1,800	1,560	1,640	1,340	1,190	926	981	816	2,750	3,300
16	1,540	2,090	1,790	1,540	1,600	1,260	1,140	1,790	937	926	2,660	2,580
17	1,520	1,940	1,860	1,540	1,580	1,210	1,150	3,310	1,970	926	2,930	2,330
18	1,500	1,940	1,880	1,540	1,610	1,260	1,120	2,840	2,050	893	2,500	2,090
19	1,610	1,960	1,920	1,380	1,620	1,320	1,130	1,530	1,240	937	2,410	1,840
20	1,730	1,980	1,960	1,460	1,640	1,360	1,090	1,180	1,020	948	2,500	1,750
21	1,750	1,970	2,020	1,500	1,640	1,340	1,050	1,090	981	880	3,490	1,900
22	1,900	1,970	1,880	1,480	1,730	1,360	1,090	1,090	948	981	2,660	2,410
23	1,790	1,960	1,970	1,450	1,580	1,370	1,130	1,530	882	1,020	2,500	2,090
24	1,760	1,880	2,030	1,440	1,500	1,300	1,090	1,620	893	937	2,410	2,250
25	1,730	1,920	2,030	1,480	1,500	1,280	1,090	2,140	926	959	2,500	2,030
26	1,690	1,980	2,030	1,410	1,560	1,300	1,020	1,820	981	1,550	2,580	1,910
27	1,640	2,090	2,040	1,370	1,640	1,240	1,060	1,460	959	2,780	2,580	1,800
28	1,650	1,900	2,000	1,300	1,600	1,250	1,050	1,460	948	8,150	2,170	1,530
29	1,720	1,500	1,880	1,380	.....	1,270	1,150	1,580	937	3,590	1,760	1,410
30	1,710	1,300	1,940	1,440	.....	1,140	1,210	2,910	871	3,590	1,920	1,370
31	1,650	.....	1,900	1,540	.....	1,090	.....	3,800	.....	3,890	1,960	.....

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2,410	1,490	1,820	112,000
November	2,330	1,300	2,030	121,000
December	2,040	915	1,770	109,000
January	2,020	1,300	1,580	97,200
February	1,730	1,400	1,570	87,200
March	1,600	1,090	1,360	83,600
April	2,090	1,020	1,230	73,200
May	3,800	871	1,470	90,400
June	3,820	871	1,470	87,500
July	8,150	816	1,570	96,500
August	3,790	1,760	2,530	156,000
September	18,900	1,020	2,430	145,000
The year	18,900	816	1,740	1,260,000

Digitized by Google

RIO GRANDE AT LANGTRY, TEX.

LOCATION.—Water-stage recorder at east end of canyon section, 1 mile southwest of Langtry, Val Verde County, and 13 miles above Pecos River.

RECORDS AVAILABLE.—May, 1900, to October, 1914; December, 1919, to March, 1920; and January, 1924, to September, 1929.

EXTREMES.—Maximum discharge during year, about 22,000 second-feet Sept. 12 (gage height, 11.15 feet); minimum, 1,100 second-feet July 24 (gage height, 1.52 feet).

1900–1914, 1919–20, 1924–1929: Maximum discharge, 132,000 second-feet Sept. 13, 1904 (gage height, 34.25 feet); minimum, 270 second-feet May 8–13, 1904.

A float measurement by W. H. Dodd on Sept. 16, 1919, at stage of 46.9 feet showed discharge of 152,000 second-feet. A stage of 56.9 feet (from floodmark by W. H. Dodd) reached about June 18, 1922.

REMARKS.—Records fair. Considerable water is diverted above station; amount not known. Flow partly regulated by storage at Elephant Butte Dam and at dams on tributaries.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,410	1,960	1,820	2,260	1,820	1,890	1,460	1,320	3,410	1,190	4,050	2,190
2	3,120	1,960	1,690	2,190	1,820	1,890	1,390	1,370	3,410	1,200	3,520	2,190
3	2,840	1,960	1,590	2,260	1,890	1,890	1,510	1,390	3,470	1,460	3,520	2,120
4	2,840	2,190	1,470	2,260	1,820	1,820	1,590	1,340	4,380	1,450	3,210	1,890
5	2,930	2,580	1,380	2,260	1,820	1,820	1,930	1,300	2,420	1,700	2,840	1,960
6	2,930	2,500	1,320	2,120	1,890	1,820	1,840	1,350	2,120	1,760	*2,840	1,700
7	2,760	2,340	1,580	2,040	1,890	1,820	1,510	1,290	1,960	1,460	*2,500	1,560
8	2,580	2,340	1,960	2,040	1,890	1,820	1,400	1,320	1,820	1,350	2,340	2,470
9	2,500	2,500	2,120	2,120	1,820	1,820	1,390	1,310	1,890	1,320	2,500	1,820
10	2,260	2,580	2,120	2,040	1,820	1,760	1,550	1,310	1,760	1,410	2,580	1,590
11	2,260	2,500	2,190	2,040	1,760	1,700	1,820	1,350	2,520	1,340	2,840	1,560
12	2,120	2,420	2,340	1,960	1,820	1,700	2,260	1,290	2,500	1,270	2,580	11,600
13	2,040	2,420	2,340	1,820	1,890	1,700	1,890	1,280	1,760	1,240	2,340	7,110
14	2,040	2,420	2,420	1,700	1,890	1,760	1,630	1,210	1,550	1,200	2,580	3,410
15	1,890	2,340	2,420	1,760	1,960	1,760	1,570	1,240	1,440	1,190	2,580	2,840
16	1,820	2,340	2,420	1,890	1,960	1,700	1,510	1,250	1,390	1,220	3,020	3,040
17	1,820	*2,310	2,260	1,890	1,960	1,700	1,490	1,300	1,300	1,150	3,020	3,310
18	1,820	*2,290	2,260	1,890	1,960	1,700	1,430	2,730	1,700	1,210	3,120	2,500
19	1,820	2,260	2,260	1,890	1,960	1,630	1,510	3,310	2,240	1,200	3,020	2,260
20	1,820	2,190	2,260	1,890	1,960	1,630	1,450	2,840	1,700	1,190	2,670	2,120
21	1,890	2,120	2,260	1,760	1,890	1,700	1,390	1,820	1,460	1,190	2,580	2,040
22	1,960	*2,090	2,340	1,760	1,960	1,700	1,360	1,550	1,300	1,200	3,120	2,040
23	2,040	*2,070	2,340	1,820	1,960	1,630	1,300	1,470	1,260	1,160	3,310	2,120
24	2,040	2,040	2,260	1,820	2,040	1,700	1,320	1,500	1,210	1,160	2,760	2,340
25	2,040	2,120	2,340	1,820	1,890	1,700	1,340	2,190	1,190	1,250	2,580	2,340
26	2,040	2,120	2,420	1,760	1,820	1,620	1,310	2,120	1,190	1,250	2,840	2,420
27	2,040	2,190	2,500	1,820	1,820	1,620	1,310	2,580	1,220	1,220	2,500	2,260
28	1,960	2,260	2,500	1,760	1,820	1,580	1,270	2,120	1,250	1,950	2,120	2,120
29	1,890	2,340	2,420	1,760	------	1,550	1,300	1,820	1,210	7,530	*1,890	2,040
30	1,890	2,040	2,340	1,700	------	1,530	1,280	1,820	1,220	5,120	*1,700	1,820
31	1,960	------	2,190	1,760	------	1,560	------	1,970	------	3,720	2,040	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	3,410	1,820	2,240	138,000
November	2,580	1,960	2,260	134,000
December	2,500	1,320	2,130	131,000
January	2,260	1,700	1,930	119,000
February	2,040	1,760	1,890	105,000
March	1,890	1,530	1,720	106,000
April	2,260	1,270	1,510	89,800
May	3,310	1,210	1,680	103,000
June	4,380	1,190	1,910	114,000
July	7,530	1,150	1,720	106,000
August	4,050	1,700	2,750	169,000
September	11,600	1,560	2,690	160,000
The year	11,600	1,150	2,040	1,470,000

* Estimated.

Digitized by Google

RIO GRANDE NEAR DEL RIO, TEX.

LOCATION.—Water-stage recorder 900 feet upstream from international highway bridge between Del Rio, Val Verde County, and Villa Acuna, Coahuila, Mexico.

RECORDS AVAILABLE.—December, 1923, to September, 1929. May, 1900, to April, 1915, records obtained 11 miles upstream; and December, 1919, to March, 1920, at McKees Switch 7½ miles upstream. Relation between gages not known. Several springs but no large tributaries enter river between the different sites.

EXTREMES.—Maximum and minimum discharges during year not determined. 1900–1915, 1919–20, 1923–1929: Maximum discharge not determined; maximum stages, 36.5 feet on gage 11 miles upstream Apr. 6, 1900, and 41.0 feet on gage 7½ miles upstream September, 1919 (relation to present gage not known). Minimum mean daily discharge, 1,120 second-feet May 12, 1904 (gage height, 3.25 feet).

Highest stage on record from floodmark, 32.8 feet (present gage datum) June 18 or 19, 1922.

REMARKS.—Records fair. Considerable water diverted above station; amount not known. Flow partly regulated by storage at Elephant Butte Dam and at dams on tributaries.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4,720	3,210		3,110	2,670	2,600	2,470	2,160	3,140	5,280		
2	4,560	3,190		3,090	2,690	2,690	2,380	2,210	4,420	2,690		
3	4,270	3,190		3,070	2,740	2,790	2,250	2,230	3,990	2,720	4,610	2,580
4	3,990	3,140		3,070	2,810	2,810	2,250	2,020	6,070	2,600		
5	3,990	3,280		3,090	2,740	2,690	2,360	1,790	3,990	2,560		2,490
6	4,130	3,590		3,280	2,720	2,650	2,670	1,850	3,360	2,580		2,670
7	3,990	3,590		3,110	2,760	2,670	2,530	2,040	3,070	2,690		2,290
8	3,860	3,860	3,340	3,070	2,760	2,690	2,580	2,100	2,830	2,290		2,360
9	3,720	3,720		2,880	2,790	2,670	2,290	2,120	2,580	1,980		3,440
10	3,720	3,860		2,830	2,690	2,690	2,160	2,100	2,740	1,910		2,580
11	3,240	4,130		2,760	2,600	2,620	2,020	1,930	2,470	2,140		2,560
12	3,260	4,130		3,040	2,600	2,580	2,290	2,600	3,280	2,040		2,230
13	3,260	3,860		3,110	2,650	2,580	2,720	2,440	3,140	2,040		
14	3,210	3,590		3,070	2,760	2,490	2,400	2,180	2,380	2,120		
15	3,110	3,860	3,720	2,830	2,830	2,470	2,080	2,000	2,210	1,950		5,920
16	3,720	3,860	3,720	2,880	2,860	2,490	2,040	2,040	1,890	1,930		
17	3,260	3,860	3,590	2,920	2,760	2,490	2,140	4,240	1,870	2,160		
18	3,070	3,720	3,590	2,900	2,790	2,510	2,120	3,070	2,040	2,020	3,180	
19	3,070	3,860	3,590	2,720	2,790	2,510	2,080	3,720	2,290	2,120		3,590
20	3,070	3,720	3,590	2,600	2,790	2,560	2,100	3,860	2,880	1,890		3,280
21	3,040	3,590	3,590	2,560	2,830	2,690	2,100	3,340	2,360	1,810		3,040
22	3,090	3,590	3,590	2,440	2,720	2,720	2,210	2,900	2,180	1,790		2,790
23	3,140	3,720	3,590	2,560	2,740	2,600	2,210	3,090	1,810	2,020		2,670
24	3,140		3,590	2,620	2,720	2,670	2,180	3,460	1,730	2,040		2,830
25	3,160		3,590	2,620	2,740	2,650	2,080	2,560	1,730	2,060		3,110
26	3,160	3,340	3,590	2,690	2,790	2,620	2,040	3,280	1,770			3,090
27	3,160		3,460	2,670	2,670	2,620	1,930	3,160	1,670			3,160
28	3,590		3,590	2,690	2,650	2,510	2,210	3,360	1,630	5,110		2,970
29	3,410		3,720	2,650	-------	2,490	2,120	4,480	1,790			2,830
30	3,260		3,720	2,670	-------	2,510	1,950	3,160	15,000			2,740
31	3,190	-------	3,460	2,530	-------	2,490	-------	2,880	-------			-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	4,720	3,040	3,500	215,000
November	----------	----------	3,580	213,000
December	----------	----------	3,490	215,000
January	3,280	2,440	2,840	175,000
February	2,860	2,600	2,740	152,000
March	2,810	2,470	2,610	160,000
April	2,720	1,930	2,230	133,000
May	4,480	1,790	2,720	167,000
June	15,000	1,630	3,080	183,000
July	----------	1,790	2,840	175,000
August	----------	----------	3,410	210,000
September	----------	----------	3,420	204,000
The year	----------	----------	3,040	2,200,000

Digitized by Google

RIO GRANDE AT EAGLE PASS, TEX.

LOCATION.—Water-stage recorder half a mile above international highway bridge between Eagle Pass, Maverick County, and Piedras Negras, Coahuila, Mexico. Zero of gage, 682.99 feet above mean sea level.

RECORDS AVAILABLE.—May, 1900, to April, 1916, and November, 1923, to September, 1929.

EXTREMES.—Maximum discharge during year, 20,100 second-feet July 1 (gage height, 8.22 feet); minimum, 1,760 second-feet June 25 (gage height, 3.14 feet).

1900–1916, 1923–1929: Maximum mean daily discharge, 238,000 second-feet June 30, 1905; maximum stage, 34.6 feet (International Boundary Commission gage) June 29, 1905; minimum mean daily discharge, 1,030 second feet Apr. 15, 1913.

In June, 1922, the river reached a stage of 43.7 feet (present gage datum). Relation between gages not known. Local residents declare this to be the highest stage known.

REMARKS.—Records good. Considerable water diverted above gage; amount not known. Flow partly regulated by storage at Elephant Butte Dam and at dams on tributaries. Discharge estimated Feb. 10, 11, and June 2.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5,420	3,800	4,150	3,580	2,870	2,680	2,500	2,050	3,060	13,200	5,150	2,410
2	5,690	3,800	3,920	3,380	2,960	2,780	2,500	2,110	3,380	3,770	4,880	2,680
3	5,420	3,800	3,580	3,270	2,960	2,870	2,410	2,240	4,630	8,660	4,880	2,780
4	5,020	3,690	3,380	3,270	3,060	2,780	2,320	2,240	3,800	3,820	4,630	2,680
5	4,580	3,690	3,270	3,380	3,060	2,870	2,240	2,160	5,950	3,480	4,380	2,590
6	4,880	3,920	3,060	3,380	2,870	2,780	2,410	1,970	3,690	2,870	3,920	2,500
7	4,880	4,150	2,960	3,580	2,960	2,780	2,870	2,000	3,160	2,870	3,690	2,680
8	4,630	4,150	2,870	3,380	2,960	2,780	3,160	2,140	2,960	2,870	3,580	2,320
9	4,500	4,150	3,160	3,480	2,960	2,780	2,590	2,160	2,780	2,680	3,380	2,410
10	4,380	4,150	3,800	3,270	2,900	2,780	2,410	2,160	2,590	2,410	3,270	3,380
11	4,150	4,380	4,040	3,160	2,840	2,780	2,240	2,160	2,680	2,320	3,380	2,680
12	3,809	4,500	4,040	3,160	2,780	2,680	2,240	3,430	2,500	2,500	3,580	2,590
13	3,920	4,500	4,040	3,480	2,780	2,680	2,500	3,380	3,060	2,410	3,690	6,930
14	3,800	4,260	4,040	3,480	2,780	2,680	2,780	2,870	2,960	2,410	3,480	10,400
15	3,690	4,040	4,040	3,380	2,960	2,680	2,320	2,410	2,320	2,410	3,380	5,020
16	3,690	4,380	4,040	3,270	2,960	2,680	2,130	2,240	2,240	2,240	3,380	13,000
17	4,150	4,260	3,920	3,380	2,960	2,680	2,080	2,320	1,920	2,240	3,380	10,800
18	3,690	4,150	3,920	3,480	2,780	2,680	2,030	6,190	1,970	2,410	3,800	5,150
19	3,580	4,150	3,800	3,270	2,960	2,680	2,020	3,270	2,060	2,240	3,800	4,040
20	3,580	4,040	3,800	3,060	2,960	2,680	2,030	4,380	2,410	2,240	4,040	3,800
21	3,580	3,920	3,800	2,960	2,960	2,630	2,080	4,150	2,780	2,080	3,480	3,580
22	3,580	3,920	3,920	2,870	2,960	2,870	2,100	3,380	2,320	2,000	3,380	3,270
23	3,580	4,040	3,920	2,780	2,960	2,680	2,160	2,780	2,160	1,970	3,380	2,960
24	3,690	4,040	3,920	2,960	2,960	2,680	2,140	8,430	1,950	2,130	4,150	2,870
25	3,800	3,920	3,800	2,870	2,960	2,680	2,030	4,110	1,870	2,110	3,690	3,060
26	3,800	3,690	3,800	2,960	2,960	2,680	2,030	3,160	2,320	2,160	3,380	3,270
27	3,800	3,800	3,920	3,060	2,780	2,680	2,050	3,580	2,000	2,430	3,380	3,270
28	3,800	3,920	3,800	2,960	2,780	2,680	2,020	3,480	1,870	7,320	3,480	3,270
29	4,040	3,800	3,920	3,060	-------	2,590	2,240	3,690	1,970	3,580	2,960	3,160
30	3,920	4,150	4,040	2,960	-------	2,500	2,130	4,700	5,720	6,200	2,780	3,060
31	3,800	-------	3,920	2,870	-------	2,500	-------	3,270	-------	8,100	2,590	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	5,690	3,580	4,170	256,000
November	4,500	3,690	4,040	240,000
December	4,150	2,870	3,760	231,000
January	3,580	2,780	3,210	197,000
February	3,060	2,780	2,920	162,000
March	2,870	2,500	2,710	167,000
April	3,160	2,020	2,290	136,000
May	8,430	1,970	3,180	196,000
June	5,950	1,870	2,840	169,000
July	13,200	1,970	3,550	218,000
August	5,150	2,590	3,690	227,000
September	13,000	2,320	4,090	243,000
The year	13,200	1,870	3,370	2,440,000

Digitized by Google

RIO GRANDE AT ROMA, TEX.

LOCATION.—Water-stage recorder at international highway bridge between Roma, Starr County, and San Pedro, Tamaulipas, Mexico. Mar. 6 to Apr. 29, gage heights obtained from staff gage at same location. Zero of gage, 145.94 feet above mean sea level.

RECORDS AVAILABLE.—August, 1900, to March, 1914; November, 1922, to September, 1925; March to September, 1929.

EXTREMES.—Maximum discharge during period not determined; maximum gage height, 12.86 feet Aug. 26; minimum discharge, 1,730 second-feet May 10 and 11 (gage height, 2.84 feet).

A gage height of 35.0 feet was reached on June 22, 1922 (discharge, 240,000 second-feet measured by slope-area method).

REMARKS.—Records fair. Considerable water diverted above gage; amount not known. Flow partly regulated by storage at Elephant Butte Dam and at dams on tributaries.

Daily and monthly discharge, in second-feet, 1929

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1	.....	2,550	1,970	6,790	3,570	3,620	2,820
2	.....	2,550	1,920	5,590	2,550	7,210	2,580
3	.....	2,470	1,970	3,970	9,920	6,120	2,390
4	.....	2,470	1,920	3,480	8,840	4,710	2,150
5	.....	2,470	1,840	3,400	15,500	4,710	2,150
6	2,630	2,420	1,880	4,020	7,680	4,530	2,340
7	*2,740	*2,380	1,970	4,050	4,260	4,220	2,400
8	2,860	4,350	2,020	5,080	3,420	3,920	2,340
9	*2,860	8,350	1,920	3,750	3,080	3,710	2,220
10	*2,850	4,690	1,770	3,210	2,760	3,570	2,290
11	2,850	6,240	1,730	2,980	2,980	3,370	2,470
12	2,750	4,240	1,810	2,770		3,110	2,350
13	2,740	3,260	1,920	2,570		2,990	2,660
14	2,700	2,960	6,030	2,510	*3,460	2,990	2,990
15	2,600	2,670	5,440	2,450		3,110	3,510
16	2,550	2,570	3,390	2,570		3,370	20,200
17	*2,650	2,670	2,950	2,830	*2,230	3,250	19,900
18	2,750	2,780	2,530	2,390	2,230	3,050	26,600
19	2,750	2,450	2,290	2,210	2,230	3,110	14,300
20	2,910	2,170	2,250	2,050	2,130	3,180	7,360
21	2,910	2,390	4,400	1,900	2,080	3,440	5,920
22	6,040	5,730	3,250	1,900	2,130	3,570	6,540
23	7,210	3,670	3,340	1,950	2,080	3,850	4,670
24	4,180	2,550	3,650	2,310	2,130	3,510	4,390
25	3,160	2,160	22,700	2,420	1,980	3,510	4,110
26	2,960	2,110	25,100	2,150	1,980	23,100	3,810
27	2,640	2,110	27,400	2,360	3,760	6,730	3,650
28	2,690	*2,040	9,580	2,200	2,210	4,240	3,650
29	2,640	*1,960	5,340	2,880	2,010	3,310	3,890
30	2,690	1,960	5,560	4,360	4,310	2,940	3,890
31	*2,620	.....	4,340	.....	5,700	3,080	.....

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March 6–31	7,210	2,550	3,110	161,000
April	8,350	1,960	3,110	185,000
May	27,400	1,730	5,300	326,000
June	6,790	1,900	3,100	184,000
July	15,500	1,980	3,900	240,000
August	23,100	2,940	4,490	276,000
September	26,600	2,150	5,680	338,000
The period	.....	.....	.....	1,710,000

* Estimated.

Digitized by Google

RIO GRANDE AT HIDALGO, TEX.

LOCATION.—Water-stage recorder at international highway bridge between Hidalgo, Hidalgo County, and Reynosa, Tamaulipas, Mexico, 0.7 mile southwest of Hidalgo. Also water-stage recorder on each of two floodway channels at the point of crossing of the east McAllen-Hidalgo highway. Zero of gages, 80 feet above mean sea level.

RECORDS AVAILABLE.—July, 1928, to September, 1929.

EXTREMES.—Maximum and minimum discharge during year not determined.

1928–29: Maximum discharge, about 47,500 second-feet Sept. 25, 1928 (gage height, 20.20 feet); minimum not determined.

The river reached a stage of 26.6 feet June 23, 1922, discharge not determined.

REMARKS.—Records good. No flow in floodway channels during period. Considerable water diverted above gage; amount not known. Flow partly regulated by storage at Elephant Butte Dam and at dams on tributaries.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9,000	4,590	4,370	3,950	2,640	2,240	2,720	1,620	4,590	4,370	4,150	3,650
2	9,000	4,820	4,370	3,950	2,720	2,240	2,480	1,590	5,660	4,590	3,950	3,560
3	8,780	4,820	4,370	3,950	2,970	2,480	2,400	1,480	5,690	3,770	4,800	3,140
4	8,580	4,590	4,480	4,050	2,970	2,400	2,320	1,440	4,590	8,980	5,560	2,640
5	8,180	4,480	4,590	4,050	2,720	2,160	2,240	1,660	3,850	12,100	4,700	2,320
6	8,180	4,370	4,820	3,850	2,640	2,060	2,160	1,590	3,480	14,000	4,050	2,000
7	7,580	4,150	4,820	3,650	2,560	2,040	2,160	1,290	3,650	6,910	4,050	1,960
8	7,060	4,150	4,700	3,400	2,480	2,080	2,160	1,320	3,950	4,160	3,950	2,240
9	6,670	4,260	4,480	3,400	2,720	2,080	3,200	1,400	4,480	3,400	3,750	2,240
10	6,410	7,140	4,260	3,310	2,970	2,320	6,710	1,320	4,370	3,060	3,480	1,960
11	6,170	13,900	4,050	3,480	3,220	2,400	4,590	1,440	3,750	2,720	3,220	2,080
12	5,930	7,070	3,750	3,650	2,640	2,320	4,940	1,400	3,220	2,640	3,060	2,160
13	5,810	5,090	3,750	3,650	2,480	2,160	4,700	1,360	2,970	3,140	2,720	4,620
14	5,810	4,700	3,850	3,560	2,400	2,160	3,650	1,700	2,720	4,480	2,560	5,820
15	5,480	5,180	4,150	3,310	2,400	2,160	3,140	3,690	2,480	4,050	2,400	4,260
16	5,300	5,560	4,480	3,140	2,320	2,240	2,970	8,310	2,480	3,750	2,480	5,380
17	5,180	5,820	4,480	3,140	2,320	2,240	2,800	5,420	2,240	3,220	2,640	17,400
18	4,940	5,090	4,370	3,310	2,320	2,240	2,640	3,850	2,400	2,800	2,880	*19,300
19	4,700	5,180	4,370	3,310	2,320	2,160	2,640	3,310	2,560	2,320	2,970	21,300
20	4,940	4,940	4,370	3,310	2,320	2,480	2,720	2,800	2,400	2,160	2,720	19,200
21	5,060	4,820	4,590	3,400	2,400	2,480	2,480	2,320	2,160	1,890	2,800	*15,000
22	4,940	4,820	4,940	3,140	2,400	2,800	2,590	2,670	1,920	1,890	3,220	*10,000
23	4,590	4,820	5,060	3,060	2,320	4,380	5,410	3,310	1,780	1,740	3,310	*8,200
24	4,370	4,820	4,700	3,060	2,480	5,960	4,420	3,140	1,780	1,620	3,400	*12,800
25	4,260	4,940	4,480	2,970	2,640	4,380	3,400	3,260	1,780	4,400	3,850	*12,500
26	4,260	4,700	4,370	2,970	2,400	3,480	2,560	*20,200	2,000	4,780	*9,070	*7,330
27	4,260	4,590	4,260	3,060	2,240	3,140	2,160	*22,400	2,000	3,310	*17,800	*5,430
28	4,480	4,590	4,260	2,800	2,240	2,970	2,160	19,600	2,000	3,220	*7,960	4,940
29	4,480	4,700	4,260	2,560	.....	2,800	2,000	*7,940	2,240	3,140	*5,300	4,700
30	4,260	4,590	4,150	2,640	.....	2,800	1,780	*4,660	2,940	2,260	*4,150	4,590
31	4,260	.....	4,050	2,560	.....	2,640	.....	4,590	.....	2,110	*3,650	.....

Month	Maximum	Minimum	Mean	Run off in acre-feet
October	9,000	4,260	5,900	363,000
November	13,900	4,150	5,260	313,000
December	5,060	3,750	4,390	270,000
January	4,050	2,560	3,340	205,000
February	3,220	2,240	2,540	141,000
March	5,960	2,040	2,660	164,000
April	6,710	1,780	3,080	183,000
May	22,400	1,290	4,580	282,000
June	5,690	1,780	3,070	183,000
July	14,000	1,620	4,100	252,000
August	17,800	2,400	4,340	267,000
September	21,300	1,960	7,090	422,000
The year	22,400	1,290	4,210	3,040,000

* Estimated.

Digitized by Google

PECOS RIVER NEAR ANGELES, TEX.

LOCATION.—Water-stage recorder in T. 26 S., R. 29 E., just below mouth of Delaware Creek, 8½ miles northwest of Angeles, Reeves County.

RECORDS AVAILABLE.—May, 1914, to September, 1929.

EXTREMES.—Maximum discharge during year, 5,610 second-feet May 17 (gage height, 4.95 feet); minimum, 46 second-feet June 28 (gage height, −0.17 foot).

1914–1929: Maximum discharge not determined (gage height, from flood-marks, 21.5 feet Aug. 8, 1916); minimum, 45 second-feet July 4 and 5, 1925.

REMARKS.—Records fair. Large part of natural flow above Carlsbad, N. Mex., diverted for irrigation; considerable water is returned by seepage. Flow is regulated to large extent by storage in reservoirs of the Carlsbad project. Discharge estimated Oct. 1–13 and May 18 and 19.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		540	493	429	272	253	123	138	167	167	324	137
2		429	500	244	272	257	111	138	178	141	262	137
3		1,610	474	210	286	267	106	168	174	108	212	141
4		989	474	231	223	257	135	141	144	117	194	117
5		1,080	467	191	198	267	132	126	151	114	199	141
6		731	454	168	202	257	90	129	120	84	174	163
7	210	645	429	161	210	267	95	117	131	90	151	137
8		770	416	165	194	194	103	135	131	108	114	151
9		700	416	151	161	168	98	123	114	120	134	167
10		435	410	165	158	183	90	151	127	99	174	167
11		850	410	141	179	183	98	138	124	90	120	212
12		664	422	151	194	194	120	93	134	87	155	243
13	214	406	410	179	175	198	98	88	93	82	167	245
14	214	657	416	223	158	175	95	108	105	99	155	212
15	240	584	410	277	175	165	98	172	102	93	151	216
16	175	527	422	282	214	191	106	202	93	114	127	243
17	198	507	435	277	227	141	123	1,690	87	87	102	308
18	210	507	422	277	194	165	135	338	90	79	114	258
19	1,720	454	422	277	175	183	129	203	90	87	99	207
20	2,240	359	416	267	151	253	120	167	108	131	105	186
21	1,050	480	429	257	123	172	123	163	87	93	111	170
22	359	461	416	282	101	144	129	199	82	99	108	170
23	311	461	416	277	138	132	126	174	87	127	120	155
24	282	480	416	267	123	117	151	203	84	105	117	190
25	262	493	416	267	132	132	165	216	66	90	108	207
26	248	500	410	262	198	138	151	178	64	90	114	224
27	231	507	422	267	231	132	138	174	66	93	131	220
28	218	507	416	277	253	148	129	155	59	187	134	174
29	218	507	296	282	------	123	151	159	111	583	131	159
30	690	500	206	282	------	129	151	141	262	368	120	178
31	1,440	------	390	277	------	126	------	159	------	375	144	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2,240	------	421	25,900
November	1,610	359	611	36,400
December	500	206	418	25,700
January	429	141	241	14,800
February	286	101	190	10,600
March	267	117	184	11,300
April	165	90	121	7,200
May	1,690	88	209	12,900
June	262	59	114	6,780
July	583	79	139	8,550
August	324	99	147	9,040
September	308	117	188	11,200
The year	2,240	59	249	180,000

Digitized by Google

PECOS RIVER NEAR COMSTOCK, TEX.

LOCATION.—Staff gage at bridge of Galveston, Harrisburg & San Antonio Railway 12 miles northwest of Comstock, Val Verde County, 5½ miles above confluence with Rio Grande, and below all tributaries.

RECORDS AVAILABLE.—May, 1900, to September, 1929.

EXTREMES.—Maximum discharge during year, 3,970 second-feet June 30 (gage height, 4.88 feet); minimum, 131 second-feet July 24.

1900–1929: Maximum discharge not determined (gage height 35.75 feet Apr. 6, 1900); minimum, 106 second-feet July 29 to Aug. 1, 1918.

REMARKS.—Records good. Considerable water diverted and stored above station for irrigation. In lower part of basin return waters tend to equalize effects of diversions. Flow at station partly controlled by storage and diversions upstream.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	399	421	625	518	298	255	280	199	182	212	182	144
2	377	468	625	518	317	255	280	182	170	187	179	144
3	377	421	625	518	298	262	280	193	170	255	173	144
4	377	399	652	518	298	280	280	190	196	317	173	141
5	356	377	680	518	298	262	280	187	196	218	167	139
6	356	468	680	493	298	280	280	187	187	187	170	157
7	356	705	680	468	280	280	262	187	182	176	164	170
8	356	570	652	468	280	262	262	179	176	167	157	506
9	356	518	652	493	280	259	317	176	170	167	154	317
10	336	806	652	444	280	242	298	182	157	164	149	298
11	336	800	625	444	280	245	262	182	157	159	144	212
12	336	832	652	421	280	245	242	215	157	154	141	190
13	336	740	652	421	262	242	242	368	149	151	141	176
14	336	740	652	377	259	238	242	252	144	151	139	179
15	317	740	652	356	262	248	235	259	144	151	144	196
16	317	770	625	336	262	252	235	280	139	144	144	421
17	317	652	625	336	262	262	235	493	139	149	141	317
18	317	740	598	356	255	280	242	317	141	146	139	280
19	317	740	598	336	259	317	228	262	139	144	139	238
20	317	740	598	336	255	317	228	252	144	144	146	235
21	317	625	598	336	248	317	231	228	144	144	146	215
22	317	680	598	317	259	317	222	228	144	141	149	193
23	317	710	544	317	252	444	218	212	144	139	151	182
24	317	652	518	298	248	336	206	212	139	134	144	179
25	317	652	518	298	255	317	202	255	141	139	157	173
26	317	652	518	280	252	317	199	298	141	380	157	170
27	727	652	518	280	262	336	202	252	139	423	154	173
28	680	598	493	280	262	317	215	248	134	202	149	167
29	518	652	493	298	.....	317	212	245	672	218	144	164
30	493	652	493	298	.....	317	199	206	1,690	199	154	167
31	444	.....	518	298	.....	298	.....	196	.....	187	157	.....

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	727	317	376	23,100
November	832	377	639	38,000
December	680	493	600	36,900
January	518	280	386	23,700
February	317	248	271	15,100
March	444	238	288	17,700
April	317	199	244	14,500
May	493	176	236	14,500
June	1,690	134	224	13,300
July	423	134	189	11,600
August	182	139	153	9,410
September	506	139	213	12,700
The year	1,690	134	319	231,000

Digitized by Google

LIMPIA CREEK NEAR FORT DAVIS, TEX.

LOCATION.—Water-stage recorder on State highway No. 3, 13½ miles northeast of Fort Davis, Jeff Davis County, and 16 miles southwest of Balmorhea.
DRAINAGE AREA.—272 square miles.
RECORDS AVAILABLE.—February, 1925, to September, 1929.
EXTREMES.—Maximum discharge during year, 858 second-feet July 28 (gage height, 3.97 feet); no flow during several periods.
1925–1929: Maximum discharge, about 3,420 second-feet Aug. 26, 1928 (gage height, 7.00 feet); no flow during several periods.
REMARKS.—Records fair. No diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.0	1.0	0.6	0.3	0		0.2	0.2	0	0.2	0.1
2	4.4	1.0	.4	.2	0		.2	.2	0	.2	0
3	3.3	1.1	.4	.1	0		.2	.2	0	.2	0
4	2.1	1.1	.4	0	0		.1	.2	0	.2	0
5	1.7	1.0	.4	0			.1	.2	0	.2	0
6	1.1	.8	.4	0			.1	.2	0	.2	0
7	1.0	.7	.4	0			.1	.2	0	.2	0
8	.8	.6	.4	0			0	.2	0	2.7	0
9	.8	.5	.4	0			0	.2	0	19	1.5
10	.7	.4	.4	0	*0		0	.1	0	14	.2
11	.6	.3	.5	.1			0	.1	0	.4	*.2
12	.6	.2	.5	.1			0	.1	0	.2	
13	.6	.2	.5	.1			0	.1	0	.2	
14	.6	.2	.6	.2			0	.1	0	.2	
15	.6	.3	.6	.2		*0.5	0	.1	0	.2	
16	.6	.2	.6	.2			.1	0	0	.2	
17	.6	.4	.6	.2			.1	0	0	.2	
18	.6	.4	.6	.2			0	0	0	.2	
19	.6	.4	.6	.2			0	0	0	.2	
20	*.6	.5	.6	.2			.1	0	0	.2	
21	*.6	.6	.6	.2			.1	0	0	.2	*.1
22	*.6	.7	.6	.2			.1	0	0	.2	
23	.6	.7		.2	*6.0		5.6	.1	0	.2	
24	.6	.8		.2			105	0	0	.2	
25	.6	.8		.2			.4	0	0	.2	
26	.6	.8	*.4	.2			.2	0	1.1	.2	
27	.7	.8		.2			.2	12	9.4	.2	
28	.7	.8		.1			.2	.2	40	.2	
29	.7	.7		.1			.2	.1	16	.2	
30	.8	.7		0		*.2	.1	0	.7	.1	
31	1.0	------		0		------	.1	------	.2	.1	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	5.0	0.6	1.11	68
November	1.1	.2	.62	37
December	------	------	.47	29
January	.3	0	.13	8.0
March	------	0	3.10	191
April	------	------	.49	29
May	105	0	3.66	225
June	12	0	.49	29
July	40	0	2.17	133
August	19	.1	1.33	82
September	------	0	.13	7.7
The year	105	0	1.16	839

* Estimated.

NOTE.—No flow during February.

Digitized by Google

GOODENOUGH SPRINGS NEAR COMSTOCK, TEX.

LOCATION.—Water-stage recorder half a mile above mouth of Arroyo which drains into the Rio Grande, 11.75 miles southwest of Comstock, Val Verde County.
DRAINAGE AREA.—Indeterminate.
RECORDS AVAILABLE.—February to September, 1929.
EXTREMES.—Maximum discharge for period not determined; minimum, 124 second-feet during several periods.
REMARKS.—Records fair. No diversions.

Daily and monthly discharge, in second-feet, 1929

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	------	139	132	124	132	139	135	139
2	------	139	128	124	132	139	135	139
3	------	139	128	128	132	143	135	139
4	------	143	128	128	139	143	135	139
5	------	139	128	128	151	143	135	139
6	------	143	128	128	147	143	135	139
7	------	143	128	128	143	143	135	139
8	------	143	128	128	143	143	135	135
9	------	143	132	128	139	143	135	135
10	------	143	132	128	139	143	135	135
11	------	143	128	130	139	139	135	140
12	------	143	128	124	135	139	135	135
13	------	139	128	124	135	139	139	135
14	------	139	128	124	135	139	139	135
15	------	139	128	124	135	139	139	135
16	------	135	128	124	132	139	139	135
17	------	135	128	130	132	139	139	135
18	------	135	128	124	132	139	139	135
19	------	135	128	124	132	135	139	135
20	------	132	128	124	132	135	139	135
21	------	139	128	124	132	135	139	135
22	------	139	124	124	128	135	139	135
23	139	143	124	124	128	135	139	135
24	143	147	128	124	128	135	139	135
25	143	143	124	128	128	132	139	135
26	143	143	124	128	128	132	139	135
27	143	143	124	128	128	132	139	135
28	139	135	124	128	124	132	139	135
29	------	135	124	132	135	132	139	135
30	------	132	124	132	144	132	139	139
31	------	132	------	132	------	132	139	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
February 23-28	143	139	142	1,690
March	147	132	139	8,550
April	132	124	127	7,560
May	132	124	127	7,810
June	151	124	135	8,030
July	143	132	138	8,480
August	139	135	137	8,420
September	140	135	136	8,090
The period				58,600

Digitized by Google

DEVILS RIVER NEAR JUNO, TEX.

LOCATION.—Water-stage recorder 500 feet below Walter Baker ranch house, 2 miles above mouth of Phillips Creek, and 13½ miles southwest of Juno, Val Verde County.

DRAINAGE AREA.—2,730 square miles.

RECORDS AVAILABLE.—May, 1925, to September, 1929.

EXTREMES.—Maximum discharge during year, about 16,000 second-feet July 26 (gage height, 11.12 feet); minimum, 68 second-feet several periods in June (gage height, 2.18 feet).

1925–1929: Maximum discharge by slope-area method, 43,700 second-feet May 29, 1925 (gage height, 15.8 feet); minimum, 64 second-feet Aug. 9–11, 1927 (gage height, 2.02 feet).

One of the highest known floods, 22.1 feet (on present gage), occurred about Sept. 1, 1916; data furnished by Walter Baker.

REMARKS.—Records fair. No diversions above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	109	101	93	97	89	82	87	74	72	186	145	89
2	107	101	92	97	87	82	89	72	72	129	135	89
3	107	101	91	97	87	82	89	72	72	140	129	87
4	107	101	91	97	87	84	87	72	72	121	125	87
5	107	101	91	97	87	84	89	70	72	113	121	87
6	107	99	91	97	87	84	89	70	70	107	117	93
7	107	99	91	95	87	84	89	72	72	103	115	87
8	109	101	91	97	87	84	87	74	72	99	113	87
9	109	101	93	97	87	84	87	72	70	93	111	86
10	109	101	93	97	87	84	84	72	70	91	107	86
11	109	99	93	97	87	84	84	72	69	89	107	86
12	107	99	93	97	87	84	82	76	70	89	105	86
13	107	99	93	97	87	84	84	74	70	89	103	84
14	107	99	93	97	86	84	82	74	70	87	105	84
15	105	99	93	95	86	86	81	74	70	87	101	84
16	107	97	93	93	86	84	82	74	70	87	101	84
17	101	95	95	93	86	91	81	81	70	86	99	84
18	101	95	97	93	86	87	82	78	70	86	99	82
19	101	95	97	91	86	87	82	75	70	84	97	82
20	101	95	97	91	86	87	81	75	70	84	97	82
21	101	93	97	93	86	87	80	75	70	82	95	80
22	99	93	97	93	84	86	78	75	70	82	95	80
23	99	93	97	93	84	86	80	75	70	82	95	80
24	101	93	97	93	86	86	78	76	70	82	93	80
25	99	93	99	91	84	86	76	74	70	82	93	80
26	99	95	97	91	84	87	76	74	72	6,430	93	78
27	97	93	97	91	86	95	78	74	70	1,910	93	78
28	97	93	97	91	86	93	76	74	70	341	93	78
29	97	91	97	91	------	89	74	76	205	192	89	76
30	101	91	95	91	------	89	75	74	1,810	165	89	76
31	103	------	95	91	------	87	------	74	------	152	89	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	109	97	104	6,400
November	101	91	96.9	5,770
December	99	91	94.4	5,800
January	97	91	94.2	5,790
February	89	84	86.2	4,790
March	95	82	85.9	5,280
April	89	74	82.3	4,900
May	81	70	74.0	4,550
June	1,810	69	133	7,910
July	6,430	82	376	23,100
August	145	89	105	6,460
September	93	76	83.4	4,960
The year	6,430	69	118	85,700

Digitized by Google

DEVILS RIVER NEAR DEL RIO, TEX.

LOCATION.—Water-stage recorder 2,200 feet above Southern Pacific Railroad bridge and Sells Creek and 12 miles northwest of Del Rio, Val Verde County.

DRAINAGE AREA.—4,000 square miles.

RECORDS AVAILABLE.—December, 1923, to September, 1929. May, 1900, to March, 1914, records were obtained 1 mile downstream at station known as Devils River at Devils River.

EXTREMES.—Maximum discharge during year, about 26,500 second-feet June 30 (gage height, 10.12 feet); minimum not determined.

1900–1914, 1924–1929: Maximum discharge not determined (gage height, 24.96 feet May 29, 1925); minimum not determined.

On Apr. 6, 1900, a stage of 25.4 feet was reached on gage 1 mile downstream. A stage of 30.15 feet, present gage datum, was reached in October, 1914, by level to floodmarks.

REMARKS.—Records below 3,000 second-feet good and above poor. No diversions above station. Flow partly regulated by dams above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*533	451	402	68	313	310	337	396	588	2,050	541	247
2	*533	429	182	56	323	304	350	369	443	795	568	242
3	*533	423	159	57	321	307	350	356	389	808	451	220
4	*526	423	226	58	361	292	143	104	368	604	409	205
5	*503	423	137	109	330	310	343	59	356	565	402	210
6	*480	423	73	380	330	307	244	259	324	518	380	226
7	*480	423	62	324	343	289	154	343	376	533	343	220
8	*473	416	62	282	362	350	226	389	317	510	293	210
9	*473	416	439	92	335	337	416	396	305	350	293	220
10	*480	416	696	*63	320	282	133	331	409	343	331	226
11	194	416	541	*56	280	318	58	274	363	526	409	226
12	409	416	480	492	331	363	56	572	289	396	365	240
13	429	267	429	488	277	318	55	580	276	503	445	299
14	389	109	382	495	330	318		343	268	526	480	318
15	347	356	376	558	395	318		318	214	382	288	247
16	*696	389	279	495	361	305		331	99	423	232	332
17	565	396	350	526	180	288	*53	916	244	518	318	369
18	416	396	382	318	375	350		654	416	458	356	288
19	458	396	382	120	334	363		451	376	503	344	356
20	458	396	382	70	332	343		311	376	276	343	357
21	436	396	382	58	341	402	*225	311	356	242	389	337
22	458	389	382	86	324	293	282	301	443	264	318	288
23	488	409	382	126	303	337	288	276	321	451	324	261
24	503	282	363	157	223	337	270	621	298	473	337	264
25	495	*68	360	303	404	331	259	423	348	382	288	299
26	488	229	369	345	350	363	115	318	352	369	305	264
27	466	343	271	244	358	305	190	277	328	6,330	318	270
28	436	396	336	349	273	293	363	308	282	1,670	247	258
29	429	409	541	326	-------	293	149	1,590	384	859	242	270
30	429	402	435	309	-------	343	221	644	9,120	645	231	258
31	451	-------	247	310	-------	337	-------	629	-------	549	231	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	696	194	466	28,700
November	451	68	370	22,000
December	696	62	339	20,800
January	526	56	246	15,100
February	404	180	322	17,900
March	402	282	323	19,900
April	416	----------	186	11,100
May	1,590	59	434	26,700
June	9,120	99	632	37,600
July	6,330	242	768	47,200
August	568	231	350	21,500
September	369	205	267	15,900
The year	9,120	----------	393	284,000

*Estimated

Digitized by Google

DEVILS RIVER SEEPAGE INVESTIGATIONS

Temporary gages were installed at five sites described below, each gage being a staff gage from 0 to 3.3 feet. From two to seven measurements were made at each station. On several occasions the stage rose above the gages. At those times daily discharge was not determined (see footnote to table of daily discharge). Records good for stations at Smith ranch and highway bridge; fair for the others.

At Gobbles ranch.—On right bank just below ranch house of M. H. Gobbles, 2½ miles below mouth of Dry Devils River, 25 miles northwest of Del Rio, Val Verde County, and 30 miles above mouth. Period of record: Mar. 22, 1928, to Apr. 27, 1929.

At Carruthers ranch.—On left bank near ranch house of J. W. Carruthers, 22 miles northwest of Del Rio, Val Verde County, and 27 miles above mouth. Period of record: Mar. 5, 1928, to Apr. 30, 1929.

At Smith ranch.—In front of Sam Smith ranch house, on left bank at Slaughter Bend crossing, 18 miles north of Del Rio, Val Verde County, and 18 miles above mouth. Period of record: Mar. 5, 1928, to Apr. 30, 1929.

At country club.—On right bank 500 feet above Devils River Country Club house, 6 miles above mouth, and 10 miles northwest of Del Rio, Val Verde County. Period of record: Mar. 12 to Sept. 21, 1928.

At highway bridge.—On right bank 800 feet above Comstock-Del Rio highway bridge, 5 miles above mouth, and 9 miles northwest of Del Rio, Val Verde County. Period of record: Jan. 1 to Sept. 21, 1928.

Daily discharge, in second-feet, of Devils River, 1928–29

Day	Highway bridge		Day	Highway bridge		Day	Highway bridge	
	January	February		January	February		January	February
1	341	341	11	341	324	21	377	308
2	359	324	12	341	341	22	359	324
3	359	324	13	341	324	23	359	316
4	359	341	14	341	324	24	341	316
5	359		15	341	324	25	341	308
6	359		16	359	324	26	341	308
7	359	324	17	359	316	27	341	308
8	359		18	359	316	28	341	308
9	359		19	341	308	29	341	301
10	359		20	359	308	30	341	-------
						31	341	-------

Digitized by Google

Daily discharge, in second-feet, of Devils River, 1928–29—Continued

Day	March					April				
	Gobbles ranch	Carruthers ranch	Smith ranch	Country club	Highway bridge	Gobbles ranch	Carruthers ranch	Smith ranch	Country club	Highway bridge
1928										
1					301	174	171	204	261	280
2					301	174	181	204	261	273
3					301	174	181	204	261	273
4					301	174	171	204	261	273
5		181	222		301	172	171	197	261	266
6		187	222		301	170	181	191	261	266
7		181	222		308	170	171	191	275	266
8		181	222		308	174	171	191	275	266
9		181	222		308	174	171	191	275	280
10		171	222		301	177	171	191	261	273
11		171	222		301	174	171	191	261	273
12		181	222	290	294	174	171	191	261	266
13		181	222	290	294	174	171	191	261	266
14		171	222	290	294	174	171	191	261	266
15		181	212	290	294	174	171	191	261	260
16		171	212	290	294	174	171	191	261	260
17		171	212	290	294	172	171	191	261	260
18		181	212	290	294	170	171	191	261	260
19		181	212	290	287	172	171	191	261	260
20		181	212	290	287	172	171	191	261	260
21		181	212	290	287	170	171	191	261	260
22	179	181	212	290	287	170	171	191	247	260
23	179	181	212	290	287	170	171	191	247	260
24	179	181	212	290	287	170	171	191	247	254
25	177	181	212	275	287	170	171	191	247	248
26	177	181	204	261	287	170	171	191	247	248
27	177	171	204	261	287	167	171	180	247	248
28	174	171	204	261	280	165	171	180	235	242
29	174	171	204	261	280	165	171	180	235	242
30	174	171	204	261	280	165	171	180	235	242
31	174	171	204	261	280					

Digitized by Google

Daily discharge, in second-feet, of Devils River, 1928–29—Continued

Day	May					June				
	Gobbles ranch	Carruthers ranch	Smith ranch	Country club	Highway bridge	Gobbles ranch	Carruthers ranch	Smith ranch	Country club	Highway bridge
1928										
1	165	171	180	235	242	194	193	204	290	308
2	165	171	180	235	237	189	221	365	(a)	(a)
3	165	181	261	(a)	545	189	207	274	408	457
4	165	181	404	(a)	(a)	189	193	248	372	359
5	165	181	204	(a)	590	189	181	248	356	341
6	165	181	204	306	359	189	181	222	338	332
7	165	181	204	275	280	189	181	222	322	316
8	165	171	191	261	266	184	181	204	306	316
9	165	171	185	261	254	184	181	204	306	308
10	165	171	180	247	254	184	181	(a)	306	308
11	165	171	185	247	254	182	181	313	306	308
12	165	171	180	247	266	189	181	300	306	308
13	230	181	(a)	(a)	(a)	242	171	274	290	308
14	(a)	(a)	(a)	(a)	(a)	(a)	(a)	248	(a)	(a)
15	(a)	(a)	(a)	(a)	(a)	(a)	(a)	248	(a)	(a)
16	(a)	(a)	(a)	(a)	590	(a)	(a)	248	(a)	(a)
17	230	252	404	(a)	479	(a)	221	222	(a)	(a)
18	219	252	326	408	457	236	207	212	408	457
19	214	252	300	372	457	225	207	204	372	416
20	214	252	274	372	377	225	207	204	372	377
21	214	252	274	372	377	214	207	(a)	356	359
22	214	252	248	356	359	214	207	(a)	356	341
23	214	207	248	338	350	203	207	(a)	338	324
24	203	207	248	338	350	203	207	235	322	324
25	203	207	222	338	341	203	207	235	322	316
26	203	207	222	322	341	208	207	235	322	316
27	198	207	222	322	341	208	207	235	322	308
28	198	193	222	306	324	208	193	222	322	308
29	198	193	222	306	324	203	193	222	306	308
30	194	193	222	306	324	198	193	204	306	308
31	194	193	204	306	308					

a Stage was above rating curve.

Digitized by Google

Daily discharge, in second-feet, of Devils River, 1928–29—Continued

Day	July					August				
	Gobbles ranch	Carruthers ranch	Smith ranch	Country club	Highway bridge	Gobbles ranch	Carruthers ranch	Smith ranch	Country club	Highway bridge
1928										
1	198	193	204	306	308	214	221	248	356	359
2	198	193	204	306	308	208	207	235	338	359
3	198	193	204	306	308	208	207	248	338	341
4	194	193	204	306	308	214	207	248	338	341
5	194	193	212	306	308	214	181	235	322	341
6	194	193	212	306	308	203	207	204	306	341
7	194	193	212	290	308	203	193	222	306	341
8	194	181	212	290	308	208	193	248	390	545
9	194	181	212	290	301	208	207	248	356	501
10	194	181	212	290	301	208	207	235	338	396
11	194	181	204	290	301	208	193	248	322	377
12	194	181	204	290	301	208	236	248	338	359
13	194	181	204	290	301	208	193	248	322	416
14	194	181	204	290	301	203	193	235	322	377
15	194	181	204	290	301	201	193	235	322	359
16	194	181	204	290	301	201	193	222	322	359
17	189	181	204	290	301	201	193	222	306	359
18	189	181	204	290	301	201	193	274	306	359
19	189	181	204	290	301	201	193	212	306	359
20	189	181	204	290	301	198	207	212	306	341
21	189	181	204	290	294	198	207	212	306	324
22	189	181	204	290	294	198	207	212	306	324
23	194	181	222	275	294	198	193	204	306	324
24	194	181	212	290	294	198	193	204	306	324
25	194	181	204	290	294	198	193	204	306	316
26	194	181	204	322	294	198	193	204	290	308
27	208	207	248	444	377	198	193	204	290	308
28	(a)	(a)	(a)	372	359	198	193	204	290	308
29	(a)	(a)	(a)	(a)	(a)	198	193	204	290	523
30	236	236	313	426	479	198	193	191	290	501
31	219	221	274	372	377	194	193	(a)	290	501

a Stage was above rating curve.

Digitized by Google

Daily discharge, in second-feet, of Devils River, 1928–29—Continued

Day	September					October		
	Gobbles ranch	Carruthers ranch	Smith ranch	Country club	Highway bridge	Gobbles ranch	Carruthers ranch	Smith ranch
1928								
1	208	193	300	408	(a)	(a)	(a)	404
2	203	207	248	338	377	(a)	(a)	391
3	203	207	222	322	341	(a)	(a)	378
4	203	207	222	306	341	(a)	(a)	378
5	193	207	222	306	324	242	(a)	365
6	198	207	222	306	324	242	(a)	352
7	194	193	214	306	324	242	252	352
8	198	193	222	306	316	242	252	326
9	198	193	222	372	316	236	252	326
10	(a)	(a)	(a)	(a)	(a)	236	252	326
11	214	(a)	(a)	(a)	(a)	236	236	326
12	214	252	300	(a)	479	230	236	326
13	214	236	274	408	416	230	236	326
14	214	207	274	381	396	230	236	326
15	214	207	261	372	386	230	236	326
16	214	207	248	356	386	242	252	352
17	214	207	248	372	386	230	236	326
18	208	207	248	356	386	225	221	326
19	208	207	248	338	377	225	221	326
20	208	207	248	338	368	225	221	326
21	208	221	274	338	436	225	221	326
22	(a)	(a)	(a)	(a)	(a)	219	221	313
23	(a)	(a)	(a)	(a)	(a)	219	221	313
24	(a)	(a)	(a)	(a)	(a)	219	221	313
25	(a)	(a)	(a)	(a)	(a)	219	221	300
26	(a)	(a)	(a)	(a)	(a)	219	221	300
27	(a)	(a)	(a)	(a)	(a)	219	221	300
28	(a)	(a)	(a)	(a)	(a)	219	221	300
29	(a)	(a)	(a)	(a)	(a)	219	221	300
30	(a)	(a)	(a)	(a)	(a)	219	228	326
31						219	236	326

(a) Stage was above rating curve.

Digitized by Google

Daily discharge, in second-feet, of Devils River, 1928–29—Continued

Day	November			December			January		
	Gobbles ranch	Carruthers ranch	Smith ranch	Gobbles ranch	Carruthers ranch	Smith ranch	Gobbles ranch	Carruthers ranch	Smith ranch
1928-29									
1	219	236	300	214	221	300	208	207	261
2	219	221	300	214	221	274	208	207	261
3	219	221	300	214	221	274	208	207	261
4	219	236	300	214	221	274	208	207	261
5	219	236	300	214	221	274	208	207	261
6	219	236	300	214	221	274	208	207	261
7	219	236	300	214	221	300	208	207	261
8	219	236	300	214	221	300	208	207	261
9	219	236	300	214	221	274	208	207	274
10	219	236	300	214	221	274	208	207	261
11	219	236	300	214	221	274	208	207	261
12	219	236	300	214	221	274	208	207	248
13	219	236	300	214	221	274	208	207	248
14	219	221	300	214	221	274	203	207	248
15	219	221	300	214	221	274	203	207	248
16	219	221	300	214	221	274	203	207	248
17	219	221	287	214	221	274	203	207	248
18	216	221	287	211	221	274	203	207	248
19	216	221	274	211	221	274	203	207	248
20	216	221	274	211	221	261	203	207	248
21	216	221	274	208	221	274	203	207	248
22	216	221	274	208	221	274	203	207	248
23	214	221	274	208	221	274	203	207	248
24	214	221	274	208	221	261	201	207	248
25	214	221	274	208	221	261	201	207	248
26	214	221	274	208	221	261	201	207	235
27	214	221	274	208	221	261	201	207	235
28	214	221	274	208	221	261	201	207	235
29	214	221	274	208	221	261	201	207	235
30	214	221	300	208	207	261	201	207	235
31				208	207	261	201	207	235

Digitized by Google

Daily discharge, in second-feet, of Devils River, 1928–29—Continued

Day	February			March			April		
	Gobbles ranch	Carruthers ranch	Smith ranch	Gobbles ranch	Carruthers ranch	Smith ranch	Gobbles ranch	Carruthers ranch	Smith ranch
1929									
1	201	207	235	196	193	222	194	181	204
2	201	207	235	196	193	222	194	181	204
3	201	207	248	194	193	222	194	181	204
4	201	207	248	194	193	222	194	181	204
5	201	207	248	194	193	222	194	181	204
6	201	207	248	194	181	222	194	181	197
7	201	207	248	194	181	212	189	181	197
8	201	207	261	194	181	212	189	181	204
9	201	207	248	194	181	212	189	181	204
10	201	207	248	194	181	212	189	181	204
11	201	207	248	194	181	222	184	181	197
12	201	207	235	194	181	222	184	181	197
13	201	207	235	194	181	222	184	181	197
14	201	207	235	191	181	204	179	181	191
15	201	207	235	189	181	204	179	181	191
16	201	207	235	189	181	204	179	181	191
17	198	207	222	194	181	212	179	181	191
18	198	207	222	198	193	222	179	181	191
19	198	207	222	198	193	222	179	181	191
20	198	193	222	198	181	222	179	181	191
21	198	193	222	208	181	248	179	181	191
22	198	193	222	194	181	235	179	181	191
23	196	193	222	194	181	222	179	181	191
24	196	193	222	194	181	222	179	181	191
25	196	193	222	194	181	222	179	181	191
26	196	193	222	194	181	204	179	181	185
27	196	193	222	194	181	204	179	181	185
28	196	193	222	194	181	222	-------	181	191
29	-------	-------	-------	194	181	222	-------	181	191
30	-------	-------	-------	194	181	204	-------	181	191
31	-------	-------	-------	194	181	204	-------	-------	-------

Digitized by Google

PINTO CREEK NEAR DEL RIO, TEX.

LOCATION.—Water-stage recorder 500 feet above Del Rio-Eagle Pass highway crossing, 4.5 miles above confluence with Rio Grande, and 16 miles southeast of Del Rio, Val Verde County.
DRAINAGE AREA.—242 square miles.
RECORDS AVAILABLE.—November, 1928, to September, 1929.
EXTREMES.—Maximum discharge during period not determined; maximum stage, 9.77 feet July 3; no flow during several periods.
REMARKS.—Records poor. Small diversions above station for irrigation. Amount not known.

Daily and monthly discharge, in second-feet, 1928–29

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	------	1.5	1.6	1.4	0.9	0.7	0	1.9	0	1.8	0
2	------	1.6	1.6	1.3	.9	.7	0	1.8	33	1.5	0
3	------	1.6	1.6	1.3	.9	.7	0	1.7	2,010	1.3	0
4	------	1.5	1.6	1.3	.9	.7	0	1.6	90	1.0	0
5	------	1.5	1.6	1.2	9	.6	0	1.5	28	.8	0
6	------	1.5	1.6	1.2	.9	.6	0	1.4	15	.6	0
7	------	1.6	1.6	1.2	.8	.5	0	1.3	8.0	.4	0
8	------	1.6	1.6	1.2	.8	.5	0	1.2	7.0	.2	0
9	------	1.6	1.7	1.1	.8	2.1	0	1.2	5.0	.1	0
10	------	1.6	1.7	1.1	.8	2.0	0	1.1	2.5	0	0
11	------	1.6	1.6	1.1	.9	1.3	0	1.1	1.5	0	0
12	------	1.6	1.6	1.1	.9	1.2	0	1.0	1.0	0	0
13	------	1.6	1.6	1.1	.9	1.2	178	1.0	1.0	0	0
14	------	1.6	1.6	1.1	.8	1.1	62	.9	1.0	0	0
15	------	1.6	1.6	1.1	.8	1.0	9.9	.9	1.0	0	0
16	------	1.7	1.6	1.1	.8	1.0	4.9	.9	1.0	0	213
17	------	1.7	1.6	1.0	.8	.9	4.9	.8	1.0	0	13
18	------	1.6	1.6	1.0	.8	.9	62	.7	1.0	0	5.5
19	------	1.6	1.5	1.0	.8	.9	7.9	0	.9	0	2.1
20	------	1.6	1.5	1.0	.9	.8	3.1	0	.8	0	1.8
21	------	1.6	1.5	1.0	.9	.8	1.8	0	.7	0	1.5
22	0	1.6	1.5	1.0	.9	.8	1.8	0	.6	0	1.3
23	0	1.6	1.5	1.0	.8	.7	255	0	.4	0	1.1
24	0	1.6	1.5	1.0	.8	0	1,610	0	.2	0	.9
25	0	1.6	1.5	.9	.8	0	74	0	.1	0	.7
26	0	1.6	1.3	.9	.8	0	19	0	14	0	.6
27	0	1.7	1.3	.9	.8	0	6.1	0	20	0	.4
28	0	1.7	1.3	.9	.8	0	14	0	8.0	0	.3
29	.6	1.7	1.3	------	.8	0	28	0	5.5	0	.2
30	1.5	1.6	1.3	------	.8	0	2.6	0	3.0	0	.1
31	------	1.6	1.4	------	.8	------	2.0	------	2.1	0	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
Nov. 22-30	1.5	0	0.23	4.2
December	1.7	1.5	1.60	98
January	1.7	1.3	1.53	94
February	1.4	.9	1.09	61
March	.9	.8	.84	52
April	2.1	0	.72	43
May	1,610	0	75.7	4,650
June	1.9	0	.73	43
July	2,010	0	73.0	4,490
August	1.8	0	.25	15
September	213	0	8.08	481
The period				10,000

Digitized by Google

GOODWIN CANAL ABOVE PENITAS, TEX.

LOCATION.—Two Venturi meters at point of diversion, 2 miles above Penitas Hidalgo County.

RECORDS AVAILABLE.—August, 1928, to September, 1929.

EXTREMES.—Maximum mean daily discharge during period, 42 second-feet Mar. 8; no flow during several periods.

Total capacity of pumping plant, 102 second-feet.

REMARKS.—Monthly records fair. Station is above all diversions from canal. Flow controlled by pumping plant. Canal diverts from left bank of Rio Grande for irrigation near Mission. Base data furnished by Hidalgo County Water Control and Improvement District No. 6.

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October (21 days)	31	6.2	21.2	884
November (14 days)	31	4.7	20.5	569
December (6 days)	36	5.2	19.2	228
January (18 days)	40	3.4	17.3	619
February (13 days)	30	6.4	17.0	429
March (13 days)	42	2.1	20.6	582
April (16 days)	34	.7	16.5	594
May (15 days)	34	2.6	17.5	521
June (10 days)	40	3.7	20.6	408
July (22 days)	40	3.1	20.4	890
August (21 days)	34	11	21.8	908
September (13 days)	20	6.4	13.0	334
The year				6,850

Digitized by Google

EDINBURG CANAL AT PENITAS, TEX.

LOCATION.—Six Venturi meters at point of diversion in Penitas, Hidalgo County.
RECORDS AVAILABLE.—July, 1928, to September, 1929.
EXTREMES.—Maximum mean daily discharge during year, 316 second-feet Feb. 22; no flow during several periods.

1928–29: Maximum discharge, that of Feb. 22, 1929; no flow during several periods.

Total capacity of pumping plant, about 350 second-feet.
REMARKS.—Records good. Station is above all diversions from canal. Flow controlled by pumping plant. Canal diverts from left bank of Rio Grande for irrigation near Edinburg. Base data furnished by Hidalgo County Water Control and Improvement District No. 1.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	113	32	70	0	60	238	45	154	0	85	106	0
2	76	70	0	81	59	212	98	183	0	95	99	37
3	0	27	128	66	0	145	63	222	0	73	80	29
4	83	0	86	122	131	172	34	84	0	0	35	94
5	0	0	0	0	184	190	80	0	0	155	129	52
6	0	0	0	0	139	232	87	159	0	80	127	125
7	0	34	0	78	203	188	0	222	0	0	126	76
8	66	54	0	52	237	189	80	193	0	70	119	77
9	97	54	0	93	90	153	0	167	0	107	86	120
10	200	0	0	95	0	43	0	173	0	119	83	54
11	130	0	0	0	160	174	0	66	23	102	121	0
12	16	0	0	0	261	177	0	30	0	31	143	0
13	0	0	0	0	300	176	0	53	69	48	132	0
14	0	129	0	124	293	155	0	0	115	0	120	93
15	174	0	0	126	283	120	0	0	86	0	122	24
16	91	0	0	114	199	119	0	0	30	0	120	22
17	43	0	0	0	271	63	0	0	120	0	125	51
18	130	0	116	95	270	116	0	0	87	43	110	0
19	136	0	108	80	291	74	0	0	0	48	117	0
20	103	56	0	0	315	55	21	0	0	101	71	0
21	87	130	0	0	290	52	0	73	0	100	0	0
22	103	129	0	140	316	0	112	31	58	57	104	0
23	94	69	0	142	229	0	111	101	0	48	80	77
24	128	0	0	124	0	0	0	0	31	58	51	0
25	107	0	0	32	170	0	27	0	0	102	44	0
26	99	0	118	66	290	0	121	0	100	0	64	54
27	68	83	94	0	277	47	51	159	46	90	94	82
28	0	61	72	129	237	47	0	88	85	0	110	0
29	112	0	0	132	------	34	112	19	117	0	123	0
30	96	0	0	150	------	34	134	0	32	126	58	61
31	67	------	0	149	------	0	------	0	------	146	12	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October (24 days)	200	16	101	4,800
November (13 days)	130	27	71	1,840
December (8 days)	128	70	99	1,570
January (21 days)	150	32	104	4,340
February (25 days)	316	59	222	11,000
March (25 days)	238	34	128	6,360
April (15 days)	134	21	78.4	2,330
May (18 days)	222	19	121	4,320
June (14 days)	120	23	71.4	1,980
July (22 days)	155	31	85.6	3,740
August (30 days)	143	12	97.0	5,770
September (17 days)	125	22	66.4	2,240
The year				50,300

Digitized by Google

MISSION CANAL NEAR MISSION, TEX.

LOCATION.—Water-stage recorder 1,200 feet downstream from Mission pumping plant, 3.4 miles south of Mission, Hidalgo County.

RECORDS AVAILABLE.—August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 290 second-feet July 9 (gage height, 5.36 feet); no flow for several periods.

1928–29: Maximum discharge, that of July 9, 1929; no flow during several periods.

REMARKS.—Records good. Canal diverts water from left bank of Rio Grande 3.5 miles south of Mission for irrigation near Mission. Flow is regulated by pumps. Granjeno Canal diverts water from this canal above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	50	124	14	97	95	195	52	125	0	0	178	3.6
2	108	134	112	107	85	207	111	178	0	0	110	0
3	28	59	131	62	.3	184	111	158	0	0	130	0
4	98	98	104	0	.1	184	94	163	0	0	82	7.0
5	.1	133	20	0	.1	173	110	189	0	0	114	124
6	54	148	0	0	0	201	113	168	0	0	113	103
7	.2	132	0	129	0	207	114	158	0	169	117	86
8	56	88	0	139	0	227	139	168	0	259	99	58
9	17	59	42	41	0	258	1.1	201	0	266	96	147
10	.7	.1	61	35	0	258	0	204	0	229	97	116
11	0	0	13	0	36	250	0	195	0	213	135	53
12	0	0	14	0	123	264	0	191	0	227	213	139
13	0	73	5.9	11	163	264	0	136	5.7	167	213	120
14	0	75	1.0	86	163	250	0	68	0	.6	207	72
15	90	65	.1	80	189	227	0	117	0	2.2	207	112
16	99	61	0	86	184	175	0	132	130	0	189	93
17	92	4.7	93	82	173	184	0	120	146	0	189	51
18	153	69	70	84	178	184	0	40	87	0	61	22
19	153	104	42	71	163	173	14	0	57	0	48	0
20	144	77	0	.1	158	178	0	0	119	57	103	0
21	123	62	0	80	163	157	0	0	189	144	178	0
22	76	0	0	92	173	0	34	0	168	168	173	0
23	.4	0	0	130	184	0	15	0	168	168	178	1.5
24	.8	0	0	75	178	0	0	0	77	184	173	6.4
25	.3	90	0	88	184	2.2	120	0	88	153	67	0
26	0	142	143	104	189	0	131	0	78	82	82	0
27	0	112	102	.2	207	4.3	61	76	66	37	107	10
28	0	5.1	36	89	201	0	77	131	30	98	63	0
29	96	.4	.5	97	------	1.5	99	44	96	201	23	85
30	98	0	0	105	------	97	95	54	38	213	0	106
31	107	------	113	117	------	95	------	3.9	------	195	0	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October (24 days)	153	0.1	68.5	3,260
November (24 days)	148	.1	79.8	3,800
December (20 days)	143	.1	55.9	2,220
January (26 days)	139	.1	80.3	4,140
February (23 days)	207	.1	139	6,330
March (26 days)	264	1.5	177	9,120
April (18 days)	139	1.1	82.8	2,960
May (23 days)	204	3.9	131	5,990
June (16 days)	189	5.7	96.4	3,080
July (21 days)	266	.6	154	6,410
August (29 days)	213	23	129	7,430
September (21 days)	147	1.5	72.2	3,010
The year				57,760

Digitized by Google

GRANJENO CANAL NEAR MISSION, TEX.

LOCATION.—Two water-stage recorders near pumping plant of United Irrigation Co., 1., 3.6 miles south of Mission, Hidalgo County.

RECORDS AVAILABLE.—August, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 108 second-feet Feb. 28; no flow during several periods.

1928–29: Maximum discharge, that of Feb. 28, 1929; no flow for several periods.

REMARKS.—Records poor. Station above all diversions from canal. Daily records not sufficiently accurate for publication. Canal diverts from Mission Canal 200 feet above station. Flow regulated at head gates. Water used for irrigation near Mission.

Monthly discharge in second-feet, 1928–29

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October (15 days)	32	1.0	10.6	314
November (18 days)	23	1.3	8.06	288
December (16 days)	18	1.0	7.61	241
January (18 days)	18	1.1	6.18	221
February (20 days)	103	2.0	51.8	2,060
March (26 days)	103	1.0	45.9	2,370
April (19 days)	34	.6	9.44	356
May (19 days)	36	.6	13.3	502
June (12 days)	30	.9	14.6	347
July (22 days)	63	1.6	25.4	1,110
August (21 days)	36	7.8	19.0	798
September (18 days)	36	6.4	16.5	588
The year				9,199

Digitized by Google

McALLEN CANAL NEAR HIDALGO, TEX.

LOCATION.—Water-stage recorder 200 feet upstream from West McAllen-Hidalgo highway crossing, 1.1 miles north of Hidalgo, Hidalgo County.

RECORDS AVAILABLE.—July, 1928, to September, 1929.

EXTREMES.—Maximum discharge during year, 67 second-feet Feb. 6 (gage height, 4.09 feet); no flow during several periods.

1928–29: Maximum discharge, that of Feb. 6, 1929; no flow several periods.

REMARKS.—Records fair. Discharge estimated Nov. 15 and 16. Canal diverts water from Rio Grande, 1.3 miles northwest of Hidalgo, for irrigation near McAllen. Entire flow regulated by pumps. Rio Bravo Canal diverts water from this canal above station.

Daily and monthly discharge, in second-feet, 1928–29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	48	0	11	17	51	0.1	43	0	3.2	12	0
2	0	38	0	19	3.0	40	0	43	0	21	17	0
3	0	0	15	29	2.4	12	0	19	0	10	6.3	5.6
4	14	0	46	21	11	36	25	4.1	0	0	0	20
5	16	0	6.0	11	24	46	17	0	0	5.4	9.6	17
6	0	0	0	0	50	37	13	21	0	7.2	23	7.2
7	0	0	0	4.8	64	32	5.2	41	0	4.2	23	0
8	0	5.9	0	2.2	55	24	26	51	0	25	53	0
9	0	12	0	23	18	12	.7	48	0	34	37	0
10	8.0	0	0	44	2.4	.6	0	45	0	40	12	9.9
11	29	0	0	36	21	4.3	0	18	4.6	39	0	27
12	22	0	5.8	10	59	30	0	0	0	26	10	20
13	14	11	23	0	60	45	0	.2	0	8.6	14	37
14	0	2.0	13	0	60	40	0	0	0	0	16	0
15	0	3.2	3.6	16	57	28	0	0	0	9.7	23	0
16	11	2.1	0	29	56	20	0	0	5.0	11	16	0
17	20	0	1.7	34	44	6.7	0	0	34	25	12	7.9
18	26	0	9.7	34	46	3.4	0	0	24	18	4.5	10
19	20	9.0	15	6.8	54	1.5	0	0	19	26	18	0
20	0	23	0	0	24	18	0	0	13	19	18	0
21	0	33	17	0	40	43	0	0	5.2	3.0	14	3.0
22	0	14	5.9	4.5	56	0	0	0	0	15	18	0
23	6.9	7.8	2.9	26	54	0	0	0	0	17	19	3.9
24	26	4.4	0	48	51	0	6.1	9.0	0	33	0	3.3
25	33	0	0	43	50	.5	28	5.6	4.0	15	0	2.5
26	36	0	1.5	0	47	.6	20	0	19	10	0	5.5
27	17	0	13	0	49	.5	4.4	0	29	0	4.9	13
28	0	0	5.9	16	50	1.0	0	18	13	0	27	1.6
29	0	3.4	4.9	34	-------	.5	5.5	2.2	6.5	2.7	35	0
30	7.4	5.5	0	53	-------	.3	22	0	0	22	25	6.0
31	40	-------	0	50	-------	.2	-------	0	-------	26	4.0	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October (17 days)	40	6.9	20.4	687
November (16 days)	48	----------	13.9	441
December (17 days)	46	1.5	11.2	377
January (24 days)	53	2.2	25.2	1,200
February (28 days)	64	2.4	40.2	2,230
March (28 days)	51	.2	19.1	1,060
April (13 days)	28	.1	13.3	343
May (15 days)	51	.2	24.5	730
June (12 days)	34	4.0	14.7	350
July (27 days)	40	2.7	17.6	944
August (26 days)	53	4.0	18.1	985
September (18 days)	27	1.6	10.6	378
The year	----------	----------	----------	9,680

Digitized by Google

RIO BRAVO CANAL NEAR HIDALGO, TEX.

LOCATION.—Great Western meter at the head gates of the Rio Bravo Canal, 1.3 miles northwest of Hidalgo, Hidalgo County.

RECORDS AVAILABLE.—July, 1928, to September, 1929.

REMARKS.—Records fair. Discharge measured in acre-feet by Great Western meter at head gates. Canal diverts water from left bank of McAllen Canal for irrigation near Hidalgo. Flow regulated by head gates. Table gives total flow in acre-feet for periods indicated.

Flow in acre-feet, 1928–29

Date	Acre-feet	Date	Acre-feet
Oct. 1–24	0	Mar. 29–Apr. 4	67
Oct. 25–Nov. 13	55	Apr. 5–May 10	0
Nov. 14–Dec. 13	8.2	May 11–June 27	20
Dec. 14–Jan. 3	36	June 28–July 2	14
Jan. 4–11	16	July 3–9	5.8
Jan. 12–16	0	July 10–19	0
Jan. 17–Feb. 2	71	July 20–Aug. 5	14
Feb. 3–Mar. 7	1,280	Aug. 6–12	8.4
Mar. 8–12	212	Aug. 13–Sept. 30	0
Mar. 13–14	85		
Mar. 15–20	261	Total	2,280
Mar. 21–28	130		

Digitized by Google

MISCELLANEOUS DISCHARGE MEASUREMENTS

In addition to the records of flow obtained at the gaging stations and reported in the preceding pages, measurements were made at other points, as shown by the following table:

Miscellaneous discharge measurements in western Gulf of Mexico basins during the year ending September 30, 1929

Date	Stream	Tributary to—	Locality	Gage height	Discharge
				Feet	*Sec.-ft.*
Oct. 30	Neches River	Gulf of Mexico	Former gaging station near Reese, Tex.	−24.96	24.3
Jan. 28	do	do	do	−19.72	752
Apr. 19	do	do	do	−20.18	760
June 18	do	do	do	−23.02	120
Aug. 8	do	do	do	−25.44	12.5
Oct. 29	Mud Creek	Neches River	Former gaging station near Ponta, Tex.	−24.03	11.5
Jan. 27	do	do	do	−16.74	1,020
Oct. 11	Village Creek	do	Former gaging station near Kountze, Tex.	−28.86	74.0
24	do	do	do	−28.52	97.6
Jan. 16	do	do	do	−21.92	1,390
Apr. 9	do	do	do	−25.60	456
28	do	do	do	−26.10	353
May 18	do	do	do	−10.48	14,900
19	do	do	do	−10.86	15,500
21	do	do	do	−11.96	12,900
22	do	do	do	−13.37	10,600
23	do	do	do	−15.50	6,080
24	do	do	do	−16.77	4,040
June 13	do	do	do	−22.68	1,000
July 6	do	do	do	−25.70	439
Aug. 14	do	do	do	−27.44	157
July 19	Brazos River	Gulf of Mexico	International-Great Northern Railroad bridge at Valley Junction, Tex.	8.11	1,130
May 28	Miller Creek	Pedernales River.	Highway crossing on Austin road near Johnson City, Tex.		[a] 22,900
28	Barton Creek	Colorado River	Near Riley, Tex		[a] 39,400
28	Little Barton Creek.	Barton Creek	Near Bee Cave, Tex		[a] 2,450
Oct. 22	Barton Springs	do	Austin, Tex		[b] 17.1
Jan. 18	do	do	do		[b] 21.5
Mar. 22	do	do	do		[b] 21.5
Apr. 29	do	do	do		[b] 37.4
June 18	do	do	do		[b] 53.8
July 19	do	do	do		[b] 67.8
Aug. 26	do	do	do		[b] 43.3
May 28	Onion Creek	Colorado River	Near Dripping Springs, Tex		[a] 21,900
28	do	do	One-fourth mile from Buda, Tex		[a] 53,200
Dec. 23	Johnson Creek	Guadalupe River.	1 mile below State fish hatchery near Kerrville, Tex.		6.18
Oct. 26	Comal River	do	1,000 feet above Comal power plant at New Braunfels, Tex.		[b] 274
26	do	do	50 feet below Comal power plant intake at New Braunfels, Tex.		[c] 172
Apr. 2	do	do	Below Comal power plant at New Braunfels, Tex.		[b] 275
May 7	do	do	do		[b] 262
June 24	do	do	do		[d] 283
July 11	do	do	do		[b] 314
11	do	do	do		[b] 308
Aug. 23	do	do	do		[b] 307
Nov. 2	San Marcos River.	do	Bridge on State highway No. 2, at San Marcos, Tex.		119
Dec. 15	do	do	do		123
Jan. 28	do	do	do		118
Mar. 13	do	do	do		136
Apr. 22	do	do	do		131
June 17	do	do	do		226
28	do	do	do		241
Aug. 23	do	do	do		180

[a] Slope measurement.
[b] Total flow of springs.
[c] Total flow of springs minus flow through power plant and swimming pool.
[d] Total flow of springs minus flow through swimming pool.

Digitized by Google

***Miscellaneous discharge measurements in western Gulf of Mexico basins during the year ending September 30, 1929*—Continued**

Date	Stream	Tributary to—	Locality	Gage height	Discharge
				Feet	*Sec.-ft.*
Sept. 11	San Marcos River.	Guadalupe River.	Bridge on Prairie Lea-Kingsbury highway, at Prairie Lea, Tex.		172
11	do	do	1 mile below highway bridge at Luling, Tex.		187
May 28	Blanco River	San Marcos River.	Blanco, Tex		[a] 43,500
28	do	do	Austin road crossing, near San Marcos, Tex.		[a] 139,000
Sept. 10	Seale Creek	do	2 miles above mouth, near Luling, Tex.		5.98
10	Plum Creek	do	200 feet above Luling-Gonzales highway bridge, near Luling, Tex.		5.79
10	Clear Fork of Plum Creek.	Plum Creek	2 miles above mouth, near Luling, Tex.		.65
10	do	do	Mouth near Luling, Tex		1.42
10	West Fork of Plum Creek.	do	One-fourth mile below San Antonio & Aransas Pass Railway bridge, near Luling, Tex.		2.01
10	do	do	do		2.03
10	do	do	Mouth, near Luling, Tex		2.65
10	Salt Fork of Plum Creek.	do	do		.94
July 26	Pecos River	Rio Grande	One-fourth mile below Sheffield-Ozona highway bridge, near Sheffield, Tex.		47.2
25	do	do	300 feet above Independence Creek, near Sheffield, Tex.		51.1
25	do	do	Just below Richland Creek, near Sheffield, Tex.		84.7
27	do	do	Langtry-Pandale highway crossing, near Pandale, Tex.		105
Dec. 9	do	do	13½ miles above mouth, near Langtry, Tex.		642
10	do	do	do		638
Jan. 1	Limpia Creek	Paisano Creek	3 miles northeast of Fort Davis, Tex.		1.28
June 2	do	do	do		.05
Jan. 1	do	do	8.4 miles northeast of Fort Davis, Tex.		1.75
June 2	do	do	do		.16
Jan. 1	do	do	12.4 miles northeast of Fort Davis, Tex.		2.04
June 2	do	do	do		.48
Jan. 1	Musquiz Creek	do	On Fort Davis-Alpine road 10 miles from Fort Davis, Tex.		.30
June 2	do	do	On Fort Davis-Alpine road about 15 miles north of Alpine, Tex.		.32
July 25	Independence Creek.	Pecos River	One-half mile above mouth, near Sheffield, Tex.		17.3
25	T-5 Spring	Independence Creek.	Hicks ranch, near Sheffield, Tex		8.42
25	Richland Spring	Richland Creek.	Just below dam, near Sheffield, Tex.		2.82
25	Wolf Spring	do	200 feet above mouth, near Sheffield, Tex.		6.15
Dec. 8	Devils River	Rio Grande	800 feet above gaging station, near Rio, Tex.	1.01	23.2
Jan. 18	San Felipe Creek.	do	Del Rio, Tex		[b] 61.5
Mar. 14	do	do	do		[b] 47.9
Apr. 16	do	do	do		[b] 55.4
May 28	do	do	do		[b] 66.8
June 13	do	do	do		[b] 58.8
July 15	do	do	do		[b] 58.3
Aug. 28	do	do	do		[b] 46.1
Sept. 28	do	do	do		[b] 46.0
Aug. 13	Villa Nueva Canal.	Diverts from Rio Grande.	Discharge from pump No. 3 near Brownsville, Tex.		91.0
13	do	do	do		88.5
13	do	do	do		85.4

[a] Slope measurement. [b] Total flow of springs. [c] Discharge estimated.

Digitized by Google

Digitized by Google

INDEX

A

Page

Accuracy of data and computed results..... 4–5
Acre-foot, definition of..... 2
Angeles, Tex., Pecos River near..... 106
Angelina River at Horger, Tex..... 17
near Lufkin, Tex..... 16
Appropriations, record of..... 1
Aspermont, Tex., Double Mountain Fork of Brazos River near..... 30
Austin, Tex., Colorado River at..... 54
evaporation near..... 55

B

Ballinger, Tex., Colorado River at..... 51
Barton Creek, Tex., discharge measurement of..... 126
Barton Springs, Tex., discharge measurements of..... 126
Belton, Tex., Leon River near..... 44
Blanco River at Wimberley, Tex..... 77
discharge measurements of..... 127
Bon Wier, Tex., Sabine River near..... 12
Boquillas, Tex., Rio Grande at..... 100
Brazos River at Rosenberg, Tex..... 36
at Seymour, Tex..... 31
at Waco, Tex..... 34
Clear Fork of, at Crystal Falls, Tex..... 39
at Fort Griffin, Tex..... 38
at Nugent, Tex..... 37
near Crystal Falls, Tex..... 40
discharge measurement of..... 126
Double Mountain Fork of, near Aspermont, Tex..... 30
near Bryan, Tex..... 35
near Glen Rose, Tex..... 33
near Mineral Wells, Tex..... 32
Brazos River Basin, Tex., gaging-station records in..... 30–50
Bridgeport, Tex., West Fork of Trinity River at..... 18
Brownwood, Tex., Pecan Bayou at..... 61
Bryan, Tex., Brazos River near..... 35

C

Calallen, Tex., Nueces River at..... 92
Cameron, Tex., Little River at..... 46
Carlsbad, Tex., North Concho River near.. 59
Carrollton, Tex., Elm Fork of Trinity River near..... 27
Castell, Tex., Llano River near..... 67
Cibolo Creek at Sutherland Springs, Tex.... 87
Circleville, Tex., San Gabriel River at..... 48
Clifton, Tex., North Bosque River near.... 41
Colorado River at Austin, Tex..... 54
at Ballinger, Tex..... 51
at Columbus, Tex..... 56

Page

Colorado River near Milburn, Tex..... 52
near Tow, Tex..... 53
Colorado River Basin, Tex., gaging-station records in..... 51–70
Columbus, Tex., Colorado River at..... 56
Comal River at New Braunfels, Tex..... 76
discharge measurements of..... 126
Comfort, Tex., Guadalupe River near..... 71
Computations, results of, accuracy of..... 4–5
Comstock, Tex., Goodenough Springs near.. 109
Pecos River near..... 107
Concan, Tex., Frio River at..... 93
Concho River near Paint Rock, Tex..... 58
near San Angelo, Tex..... 57
Control, definition of..... 2
Cooperation, record of..... 10
Cotulla, Tex., Nueces River at..... 90
Crystal Falls, Tex., Clear Fork of Brazos River at..... 39
Clear Fork of Brazos River near..... 40
Cuero, Tex., Guadalupe River below..... 74

D

Dallas, Tex., Trinity River at..... 22
Data, accuracy of..... 4–5
explanation of..... 2–4
Del Rio, Tex., Devils River near..... 111
Pinto Creek near..... 119
Rio Grande near..... 102
Del Valle, Tex., Onion Creek near..... 70
Derby, Tex., Frio River near..... 94
Devils River, Tex., discharge measurement of..... 127
near Del Rio, Tex..... 111
near Juno, Tex..... 110
seepage investigations..... 112–118
Divot, Tex., Leona River near..... 94

E

Eagle Pass, Tex., Rio Grande at..... 103
Easterly, Tex., Navasota River near..... 50
Edinburg Canal at Penitas, Tex..... 121
El Paso, Tex., Rio Grande near..... 97
Elephant Butte Dam, N. Mex., Rio Grande below..... 96
Evadale, Tex., Neches River at..... 15

F

Fabens, Tex., Rio Grande near..... 98
Falls City, Tex., San Antonio River near.... 81
Finlay, Tex., Rio Grande near..... 99
Fort Davis, Tex., Limpia Creek near..... 108
Fort Griffin, Tex., Clear Fork of Brazos River at..... 38

Digitized by Google

	Page
Fort Worth, Tex., Clear Fork of Trinity River at	25
West Fork of Trinity River above	19
West Fork of Trinity River at	20
Frio River at Concan, Tex	93
near Derby, Tex	94
G	
Glen Rose, Tex., Brazos River near	33
Goliad, Tex., San Antonio River at	82
Goodenough Springs near Comstock, Tex	109
Goodwin Canal above Penitas, Tex	120
Grand Prairie, Tex., Mountain Creek near	26
West Fork of Trinity River at	21
Granjeno Canal near Mission, Tex	123
Guadalupe River above Comal River, at New Braunfels, Tex	73
below Cuero, Tex	74
near Comfort, Tex	71
near Spring Branch, Tex	72
seepage investigations	75
Guadalupe River Basin, Tex., gaging-station records in	71–87
H	
Hamilton, Tex., Leon River near	43
Handley, Tex., Village Creek near	26
Hidalgo, Tex., McAllen Canal near	124
Rio Bravo Canal near	125
Rio Grande at	105
Horger, Tex., Angelina River at	17
Humble, Tex., San Jacinto River near	29
I	
Independence Creek, Tex., discharge measurement of	127
J	
Johnson Creek, Tex., discharge measurement of	126
Junction, Tex., Llano River near	66
North Llano River near	65
Juno, Tex., Devils River near	110
L	
Laguna, Tex., Nueces River at	88
Lampasas River at Youngsport, Tex	47
Langtry, Tex., Rio Grande at	101
Leon River near Belton, Tex	44
near Hamilton, Tex	43
Leona River near Divot, Tex	94
Limpia Creek, Tex., discharge measurements of	127
near Fort Davis, Tex	108
Little Barton Creek, Tex., discharge measurement of	126
Little River at Cameron, Tex	46
near Little River, Tex	45
Llano River near Castell, Tex	67
near Junction, Tex	66
Lockhart, Tex., Plum Creek near	79
Logansport, La., Sabine River at	12
Longview, Tex., Sabine River near	11
Lufkin, Tex., Angelina River near	16
M	
McAllen Canal near Hidalgo, Tex	124
Medina Canal near Riomedina, Tex	86
Medina River near Pipe Creek, Tex	84
near Riomedina, Tex	85
Menard, Tex., Noyes Canal at	64
San Saba River at	62
Milburn, Tex., Colorado River near	52
Miller Creek, Tex., discharge measurement of	126
Mineral Wells, Tex., Brazos River near	32
Mission, Tex., Granjeno Canal near	123
Mission Canal near	122
Mountain Creek near Grand Prairie, Tex	26
Mud Creek, Tex., discharge measurements of	126
Musquiz Creek, Tex., discharge measurements of	127
N	
Navasota River near Easterly, Tex	50
Neches River at Evadale, Tex	15
discharge measurements of	126
near Rockland, Tex	14
Neches River Basin, Tex., gaging-station records in	14–17
New Braunfels, Tex., Comal River at	76
Guadalupe River at	73
North Bosque River near Clifton, Tex	41
North Concho River at San Angelo, Tex	60
near Carlsbad, Tex	59
North Llano River near Junction, Tex	65
Noyes Canal at Menard, Tex	64
Nueces River at Calallen, Tex	92
at Cotulla, Tex	90
at Laguna, Tex	88
near Three Rivers, Tex	91
near Uvalde, Tex	89
Nueces River Basin, Tex., gaging-station records in	88–94
Nugent, Tex., Clear Fork of Brazos River at	37
O	
Oakwood, Tex., Trinity River near	23
Onion Creek, Tex., discharge measurements of	126
near Del Valle, Tex	70
Ottine, Tex., San Marcos River at	78
P	
Paint Rock, Tex., Concho River near	58
Pecan Bayou at Brownwood, Tex	61
Pecos River, Tex., discharge measurements of	127
near Angeles, Tex	106
near Comstock, Tex	107
Pedernales River at Stonewall, Tex	68
near Spicewood, Tex	69
Penitas, Tex., Edinburg Canal at	121
Goodwin Canal above	120
Pinto Creek near Del Rio, Tex	119
Pipe Creek, Tex., Medina River near	84
Plum Creek, Clear Fork of, Tex., discharge measurements of	127
discharge measurement of	127

Digitized by Google

	Page
Plum Creek, near Lockhart, Tex	79
Salt Fork of, Tex., discharge measurement of	127
West Fork of, Tex., discharge measurements of	127
Publications, information concerning	5–9
obtaining or consulting of	6–7
on stream flow, lists of	7, 9
R	
Richland Spring, Tex., discharge measurement of	127
Rio Bravo Canal near Hidalgo, Tex	125
Rio Grande at Boquillas, Tex	100
at Eagle Pass, Tex	103
at Hidalgo, Tex	105
at Langtry, Tex	101
at Roma, Tex	104
at San Marcial, N. Mex	95
at Tornillo Bridge, near Fabens, Tex	98
below Elephant Butte Dam, N. Mex	96
below Old Fort Quitman, near Finlay, Tex	99
near Del Rio, Tex	102
near El Paso, Tex	97
Rio Grande Basin, N. Mex.-Tex., gaging-station records in	95–125
Riomedina, Tex., Medina Canal near	86
Medina River near	85
Riverside, Tex., Trinity River at	23
Rockland, Tex., Neches River near	14
Rockwall, Tex., East Fork of Trinity River near	28
Roma, Tex., Rio Grande at	104
Romayor, Tex., Trinity River at	24
Rosenberg, Tex., Brazos River at	36
Ruliff, Tex., Sabine River near	13
Run-off in inches, definition of	2
S	
Sabine River at Logansport, La	12
near Bon Wier, Tex	12
near Longview, Tex	11
near Ruliff, Tex	13
Sabine River Basin, Tex.-La., gaging-station records in	11–13
San Angelo, Tex., Concho River near	57
North Concho River at	60
San Antonio, Tex., San Pedro Creek at	82–83
San Antonio River at Goliad, Tex	82
at San Antonio, Tex	80
near Falls City, Tex	81
San Felipe Creek, Tex., discharge measurements of	127
San Gabriel River at Circleville, Tex	48
San Jacinto River near Humble, Tex	29
San Marcial, N. Mex., Rio Grande at	95
San Marcos River at Ottine, Tex	78
discharge measurements of	126–127
San Pedro Creek at San Antonio, Tex	82–83
San Saba River at Menard, Tex	62
near San Saba, Tex	63
Seale Creek, Tex., discharge measurement of	127
Second-feet per square mile, definition of	2
Second-foot, definition of	2
Seymour, Tex., Brazos River at	31
Somerville, Tex., Yegua Creek near	49
South Bosque River near Speegleville, Tex	42
Speegleville, Tex., South Bosque River near	42
Spicewood, Tex., Pedernales River near	69
Spring Branch, Tex., Guadalupe River near	72
Stage-discharge relation, definition of	2
Stonewall, Tex., Pedernales River at	68
Sutherland Springs, Tex., Cibolo Creek at	87
T	
T-5 Spring, Tex., discharge measurement of	127
Terms, definition of	2
Three Rivers, Tex., Nueces River near	91
Tow, Tex., Colorado River near	53
Trinity River at Dallas, Tex	22
at Riverside, Tex	23
at Romayor, Tex	24
Clear Fork of, at Fort Worth, Tex	25
East Fork of, near Rockwall, Tex	28
Elm Fork of, near Carrollton, Tex	27
near Oakwood, Tex	23
West Fork of, at Bridgeport, Tex	18
at Fort Worth, Tex	20
at Grand Prairie, Tex	21
at Lake Worth Dam, above Fort Worth, Tex	19
Trinity River Basin, Tex., gaging-station records in	18–28
U	
Uvalde, Tex., Nueces River near	89
V	
Villa Nueva Canal, Tex., discharge measurements of	127
Village Creek, Tex., discharge measurements of	126
near Handley, Tex	26
W	
Waco, Tex., Brazos River at	34
Wimberley, Tex., Blanco River at	77
Wolf Spring, Tex., discharge measurement of	127
Work, authorization of	1
division of	10
scope of	1–2
Y	
Yegua Creek near Somerville, Tex	49
Youngsport, Tex., Lampasas River at	47

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Stanford University Libraries
3 6105 007 643 864

Digitized by Google

Digitized by Google

Stanford University Libraries
3 6105 007 643 864

Digitized by Google

Digitized by Google